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Exploring and counteracting stage specific course completion risk factors in open higher education distance learning

Research Article

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Abstract: A major challenge for distance learning in higher education is supporting course completion. Counteracting completion risk factors requires investigating their significance across (non)completion stages. We tested the predictability of known risk factors at each completion stage. Not initiating was explained by available time, low motivation and completion methods. Abandonment was predicted by life situation and inappropriate completion methods. Failed submissions were explained by difficulty level and material availability. At early stages, supporting motivation by designing suitable course completion methods seems the most effective risk countermeasure. At later stages, academic skills protect from non-completion. Intrinsic motivation requires experiencing competence, autonomy and relatedness. Flexible distance learning methods with constructive, informational feedback and social interaction in the instructional design might best support course completion.

Keywords: *Course completion; Study engagement; Student retention; Study motivation; Distance learning; Open higher education*

Introduction

Digitalisation and lifelong learning education policies keep pushing higher education from classrooms towards flexible distance learning, free from the restrictions of place and time. This change is especially prominent in open university studies, and the development has been further expanded and accelerated under the COVID-19-pandemic lockdown restrictions. Electronic completion methods have replaced their traditional counterparts. The ensued flexibility in study practices has benefitted and supported students' autonomy in study selection and completion. This development has also facilitated enrolling and participating in higher education, and the availability of online courses has hugely increased.

However, not all changes have facilitated studying or teaching in the distance learning environments. As the face-to-face student support and guidance methods have become inapplicable, the trade-off for flexibility means greater self-guidance and responsibility required from students for adequate learning and study performance. Distance learning requires investment in technical implementation of the flexible teaching and completion methods (Tu & Corry, 2002). The biggest challenge for distance learning seems to be study engagement or

student retention—course completion levels are lower in distance learning than in contact teaching (Lee & Choi, 2011; Shah & Cheng, 2019; Woodley & Simpson, 2014)—due to poor pedagogical quality, low social contacts, study motivation or study skills (Lee & Choi, 2011; Lee et al., 2013). Low social contact in distance learning has also been found to reflect impaired learning (Alqurashi, 2019; Kuo et al., 2014). Student dropout is a major problem for institutions' funding.

Student retention, dropout and attrition are related, widely researched topics in distance learning (for recent reviews, see Delnoij et al., 2020; EADTU, 2024; Elibol & Bozkurt, 2023; Seery et al., 2021; Shaikh & Asif, 2022). It is not always clear what counts as attrition or dropout (Elibol & Bozkurt, 2023). Typically, these concepts refer to a student quitting a degree programme and a problem for student services. When a student does not complete a single course, the concern is in the pedagogical course design (Woodley & Simpson, 2014). Online courses have become a major industry (Bawa, 2016; Seery et al., 2021), yet few dropout studies focus on completion of single courses (Aragon & Johnson, 2008; Hachey et al., 2023; Lee et al., 2013; for a review, see Bawa, 2016), with the exception of massive open online courses (MOOCs) (Chen et al., 2022; Huang et al.,

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2023). Online course design is the main reason for non-completion (Rahmani et al., 2024), so it is important to study these reasons, and how the course design can most effectively support completion.

In this article, we focus on course completion risk factors and their variation across completion stages in open higher education distance e-learning. Our particular emphasis is on identifying how and when to support students' study performance and engagement to prevent student dropout during a course. Addressing these challenges is crucial at the individual, organisational and societal levels. Successful completion of the studies undertaken will, first, ensure that adult learners achieve their learning goals, thus reinforcing their sense of competence. Second, it will enhance the higher education community's experience of success at work and improve the educational and economic efficiency of the organisation. Engaging individuals in their learning improves institutional success and contributes to the overall improvement of the higher education system. At the societal level, the completion of studies responds to the new skill needs of today's changing world of work. Hence, several systems for identifying individuals at risk and in need of appropriate student support, for example, using machine learning, have been developed (e.g. Yükseltürk et al., 2014). Strengthening study engagement and effectively targeting student support would require an understanding of the risk factors across all study stages.

We studied course completion in open university students participating exclusively in distance learning courses. Typically, the amount of funding granted for a higher education institute at least in Finland depends on its study engagement level. To support course completion, the most significant risk factors should be identified (Valto & Lundell, 2015). In previous studies, the most important preventive factors to open higher education distance learning have been as follows: reconciling work or other life with studies (Maunula et al. 2021; cf. Pekkala, 2004; Repo et al., 2014; Saarenmaa & Virtanen, 2011; Yükseltürk & Inan, 2006), students moving to work life before finishing their studies (Maunula et al. 2021; cf. Aho et al., 2012), technical challenges related to the learning environment (Aydin et al., 2019; Gaytan, 2015), lack of academic study skills (Bağrıacık Yılmaz & Karataş, 2022; Yükseltürk et al., 2014) and passivity in seeking guidance in learning the skills (Maunula et al., 2021), low motivation levels compared with contact teaching (Maunula et al. 2021; cf. Pekkala, 2004; Repo et al., 2014; Törmä et al., 2012), and lack of social support and interaction (Lee & Choi, 2011).

Devising efficient protective countermeasures

for course non-completion based on these studies is not a straightforward task and calls for more detailed data about the course completion risk factors. Our approach to this issue is above all practical: to support as efficiently as possible course completion in distance learning. Targeting appropriate countermeasures requires detailed data about the risk factors' effects at each study completion stage. Instead of formulating specific hypotheses, we explored course completion risk factors in further temporal detail than done in previous studies. We investigated study engagement risk factors in four different course completion stages. We expected that course completion risk factors may differ at different stages of study. Finally, we will discuss practical but science-based suggestions for supporting course completion at different stages. We will specifically discuss how to apply the self-determination theory of study motivation in improving completion rates by pedagogical course design (Chen & Jang, 2010; Chiu, 2021; Howard et al., 2021; Hsu et al., 2019; Ryan & Deci, 2018, 2020). According to the theory, student wellbeing and genuine interest in studies depends on experienced competence, autonomy, and social interaction and support. We argue based on our results that genuine learning engagement can be the most effectively supported by designing appropriate completion methods.

Implementation of the study

To study completion risk factors at different stages of the courses, we sent a Webropol questionnaire by email to undergraduate psychology students at a Finnish open university in the academic year 2020–21 ($n = 1,024$). We measured the students' reported course completion performance using a 4-point categorical scale 1 = not initiated, 2 = abandoned (initiated but not submitted), 3 = (submitted but) failed, and 4 = completed (cf. Kember, 1995).

To measure the students' self-reported levels of study engagement risk factors during their study progress we compiled a questionnaire using a 7-point Likert-scale items (1 = very well to 7 = not at all, including an extra item for not applicable). The questions concerned the following 11 risk factors for course completion, in two categories: instructions and formative feedback, skill/difficulty levels, completion method, learning material and its availability, learning environment and study schedule (pedagogy-related), study motivation, available time and life situation (student-based). The items were phrased: 'How well did [risk factor] support completing the course?' where applicable. Study motivation was

probed by an item formulated 'How motivated were you towards studying on the course?'. Individual personality features and learning styles were also charted, but for clarity and brevity, these are not reported here.

A total of 295 students ($M_{\text{age}} = 35.42$, standard deviation [SD] = 10.27, 266 females, 26 males, 3 individuals identified with other gender) completed the survey (response rate 28%). Of these, 70 students reported not completing at least one course despite registration. We avoided collecting any personal identity information in the questionnaire. Because of complete data anonymity, our study did not require statement from the local ethical committee according to the committee's guidelines. To study the adequacy of our sample, a sample-size estimate using an online calculator (<https://sample-size.net/logistic-regression-sample-size/>) with odds ratios = 2, sample proportion = 0.1/0.9, SD = 1, 2-tailed α -level = 0.05 and $\beta = 0.80$, yielded a sample size of ~200 and a more conservative estimate taking the data collinearity into account, $\rho^2 = 0.4$, yielded a sample size of ~300. Based on this estimate, the sample is sufficient for detecting effects starting from small to medium sized ones.

We also asked open-ended questions about what supported their course completion, and what prevented them from it with the following four open-ended questions: (1) If a course was not completed, what factors made it difficult to complete the course? (78 responses); (2) What factors specifically supported learning? (183 responses); (3) What kind of completion methods would you have wished? (160 responses), and (4) What kind of further guidance would you have required? (111 responses). Responses to these open

questions were analysed using content analysis by identifying and categorising key concepts. In responses to the first two questions, main distinction made was between individual student-based and pedagogy-related factors. The purpose of recognising the key concepts was to complement the results from the quantitative analyses, and to similarly help in designing engaging distance e-learning courses.

Results

Descriptive and reliability analysis

The descriptive and reliability data—mean, SD, as well as normality and collinearity diagnostics—of the study engagement risk factor variables are given in Table 1. The distribution of two variables (Instructions and Formative feedback) showed slight skewness and/or excessive kurtosis. Nevertheless, the statistical analysis method used, logistic regression, is not sensitive to these slight violations of normality. The method is, however, sensitive to collinearity between the independent variables, and this was tested producing variance inflation factors (VIFs) for each risk factor variable. VIFs, as given in Table 1, showed no risk for collinearity (all <5).

Modelling the risk factors' effects at each course completion stage

We modelled the significance of study engagement risk factors using logistic regression at different levels of course completion: 1. course completed ($n = 256$), 2.

Table 1. Descriptive and reliability statistics

Independent variables	M	SD	Skewness	Kurtosis	VIF
Motivation	4.56	1.78	−0.27	−1.14	1.57
Available time	3.23	1.26	−0.19	−0.76	1.91
Life situation	2.32	1.06	0.68	0.75	1.85
Instructions	2.72	1.01	0.97	2.86	1.56
Formative feedback	2.57	0.95	1.14	4.18	1.50
Difficulty level	3.38	1.36	−0.08	−0.62	2.19
Completion method	2.63	1.10	0.70	0.90	2.17
Study material	2.51	0.93	0.62	0.74	1.57
Material availability	2.83	1.15	0.30	−0.18	2.21
Learning environment	2.38	0.96	0.74	0.86	1.40
Study schedule	2.63	1.27	0.77	0.45	1.51

SD, standard deviation; VIF, variance inflation factor.

failed ($n = 13$), 3. abandoned ($n = 33$), and 4. not initiated ($n = 34$), as dependent categorical dummy variables and the risk factors as independent variables. The regression models for each stage of completion were significant: completion: $\chi^2(12) = 98.335, p < 0.001$; failed: $\chi^2(12) = 25.402, p < 0.05$; abandoned: $\chi^2(12) = 37.959, p < 0.01$; not initiated: $\chi^2(12) = 66.099, p < 0.01$, meaning the risk factors significantly predicted completion at each stage. The models explained 45.7%, 27.4%, 24% and 39.4% (Nagelkerke R^2) of the respective risk factors' variances and correctly classified 81.6%, 95.9%, 88.8% and 90.8% of the observation units, respectively.

The level of each study engagement risk factor (adjusted odds ratio) at each (non)completion stage is shown in Table 2. At each stage of non-completion, an odds ratio <1 means reduced completion risk, and an odds ratio >1 means elevated risk. For example, an odds ratio of 2:1 of a risk factor means that a 1-unit increase of the risk factor doubles the risk, a 2-unit increase quadruples the risk and so forth.

AOR Exp(B) with 95% confidence interval [lower limit, upper limit] for each risk factor at each completion stage. AORs >1 indicate elevated non-completion risk, and AORs <1 decreased non-completion risk, and AOR = 1 no risk. Statistically significant odds ratios are highlighted in bold.

AOR, adjusted odds ratios.

Study motivation, available time and completion method significantly explained successful course completion.

The task difficulty level and poor availability of the learning material significantly predicted failing after submission. Life situation and completion method were associated with abandoning completion after initiating the task. Failure to initiate depended on the time available for studies, study motivation and completion method. Figure 1 summarises the significance of each critical risk factor at different non-completion stages by showing the predicted changes in probability (B-coefficient of the logistic regression model) for a 1-unit step in risk factor level response.

Qualitative results on course completion risk factors

In responses to open questions, the students reported individual student-based and pedagogy-related factors that made it difficult for them to complete their studies. Among the individual student-based factors, time management issues became the most important ones: for adult students, reconciling study with work and family life often leaves insufficient time for studying. Students complained that study progression became hampered by sudden personal life changes, such as getting sick, starting in a new job or studying another degree. Another individual related factor was poor study skills, especially inexperience in scientific writing, poor digital skills or insufficient study material language comprehension. Another reported study hindrance was lack of motivation or interest towards studying. These results broadly replicate the quantitative results reported in this study,

Table 2. Course completion risk factor significance at each completion stage

Risk factor	Completion stage			
	Completed	Failed	Abandoned	Not initiated
<i>Student-based risk factors</i>				
Motivation	0.46 [0.30, 0.72]	0.98 [0.52, 1.85]	1.07 [0.71, 1.61]	1.80 [1.12, 2.90]
Available time	0.62 [0.41, 0.93]	1.48 [0.71, 3.09]	1.01 [0.65, 1.58]	1.98 [1.21, 3.26]
Life situation	0.70 [0.48, 1.01]	1.04 [0.54, 1.99]	1.66 [1.09, 2.54]	1.25 [0.81, 1.92]
<i>Pedagogy-related risk factors</i>				
Instructions	1.09 [0.67, 1.77]	1.42 [0.71, 2.84]	1.12 [0.67, 1.87]	1.06 [0.61, 1.83]
Formative feedback	0.87 [0.69, 1.09]	1.29 [0.87, 1.92]	1.34 [0.81, 2.20]	1.21 [0.93, 1.57]
Difficulty level	0.94 [0.59, 1.51]	2.11 [1.09, 4.09]	1.34 [0.85, 2.20]	1.05 [0.62, 1.79]
Completion method	0.47 [0.28, 0.80]	0.76 [0.37, 1.55]	1.70 [1.05, 2.77]	2.33 [1.29, 4.24]
Study material	1.74 [0.99, 3.06]	0.86 [0.36, 2.06]	0.74 [0.41, 1.34]	0.65 [0.34, 1.24]
Material availability	0.94 [0.65, 1.36]	1.93 [1.03, 3.60]	1.09 [0.72, 1.65]	0.74 [0.74, 1.16]
Learning environment	0.84 [0.51, 1.40]	1.44 [0.66, 3.14]	0.90 [0.53, 1.52]	0.92 [0.53, 1.61]
Study schedule	1.07 [0.73, 1.57]	0.69 [0.36, 1.36]	1.09 [0.73, 1.64]	0.91 [0.58, 1.42]

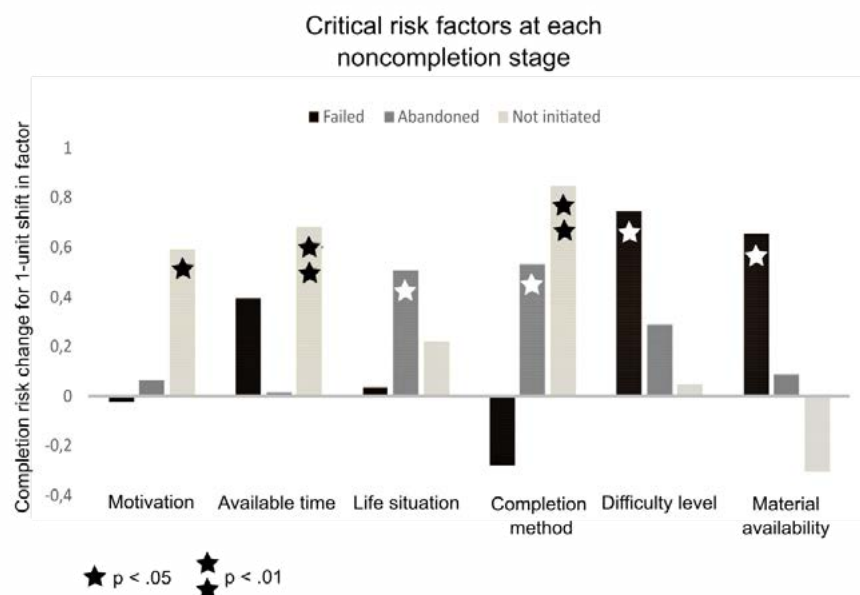


Figure 1: The statistically significant risk factors for each course non-completion stage and their predicted probability change for 1-unit change in risk factor.

and qualitative results reported in a study by Maunula et al. (2021).

The most important challenges related to the study environment, according to the students, were workload and study difficulty level: the tasks were considered overly extensive or challenging, and the scientific literature difficult to understand. The use of e-learning systems required learning and was burdened by technical problems. Starting studies independently seemed too difficult; in the beginning there was a need for clear guidance.

The factors that made it difficult for students to complete their studies can be summarised as follows:

Student-related risk factors:

- Time management issues (reconciling study with work and family life).
- Sudden personal life changes (e.g. illness, new job or studying another degree).
- Poor study skills (inexperience in scientific writing, digital skills or study material language comprehension).
- Lack of motivation or interest towards studying.

Pedagogy-related risk factors:

- Workload and study difficulty level (tasks considered overly extensive or challenging, and scientific literature difficult to understand).
- Technical problems with e-learning systems.
- Need for clear guidance in the beginning of studies.

Qualitative results on factors supporting course completion

Among the individual student-based factors supporting the progress of studies, one's own motivation and interest in the topic emerged. Students felt the support of close and peer students was important to them: the sense of belonging is a basic human need, the satisfaction of which greatly affects motivation levels towards a given activity (Ryan & Deci, 2018, 2020). The progress of studies was aided by a favourable life situation, in the form of study leave or a stable work situation.

The most important pedagogy-related factors were clear instructions for completing the study. The division of tasks into smaller sub-tasks was also praised: frequent testing and longer study time enhance learning and study motivation (cf. Dunlosky et al., 2013; Putnam et al., 2016). Students valued assessment and written feedback from the teacher, which foster feelings of competence, and effectively support study motivation; in the literature, student–instructor interaction (Gaytan, 2015; Shikulo & Lekhetho, 2020; Sorensen & Donovan, 2017), its quality (Stone & O'Shea, 2019) and the instructors' qualifications (Thistoll & Yates, 2016) are associated with course completion efficacy.

E-learning materials are readily available and lecture recordings could be viewed on students' own schedule. Online study was possible regardless of place of residence. The progress of studies is aided

by community interaction with the teacher and other students. The teacher was asked to provide support and guidance at different stages of his studies, as well as active, close and personal communication.

The organisational support is related to the university's curricula, the information systems, the student community, teacher activities and course content (Gaytan, 2015). Before registering, it is important to know the course contents and schedules. An electronic study guide describing the open university's study offer, study methods, study schedules and course contents was considered important.

In response to the third question about preferred course completion methods, students wished for diverse and varied completion methods from which to choose a suitable one for their background, learning style and life situation. In general, they felt that a process-based and time-sensitive learning assignment broken down into smaller sub-tasks best supported their studies. The least liked were the exams; they do not support learning and are mentally burdensome because of test anxiety and time pressure. Graphic learning instructions and ready-made templates for essays were needed for both the learning assignments and the exams.

Social interaction was another praised supportive factor. This insight emerged from the analyses of the responses to the fourth question about preferred types of guidance. Students mentioned peer feedback and discussions in workspace forums and in social media groups were described as ways to increase learning motivation and efficacy. Gaining personal guidance and discussions with the teacher were also perceived as factors that strengthened students' sense of communal belonging.

The factors supporting the progress of studies can be classified as follows.

Student-dependent supporting factors:

- One's own motivation and interest in the topic
- Support from significant people and peer students
- Favourable life situation (e.g. study leave or stable work situation)

Pedagogy-related supporting factors:

- Clear instructions for completing the studies
- Dividing tasks into smaller sub-tasks
- Assessment and written feedback from the teacher
- Availability of e-learning materials and lecture recordings
- Interaction with the teacher and other students
- Teacher's support and guidance at different stages
- Active, close and personal communication

Discussion

We studied course completion risk factors at different completion stages in open higher education distance learning courses. We found that risk factors vary across the course completion stages. Low motivation, inappropriate completion methods and lack of time were associated with not initiating the course completion; conversely, high motivation, appropriate completion method and sufficient available time best supported course completion. Inappropriate completion methods were also associated with task abandonment. The other significant risk factors at this stage, a changed personal life situation, is relatively immune to pedagogical countermeasures. Difficulty level (lack of academic study skills) also identified as a significant risk factor in previous studies (Maunula et al., 2021), did not, surprisingly, risk course completion until at the final stage. The unavailability of study materials, also observed as a significant study engagement risk factor at the latest stage, is probably an institute specific risk factor. Students' reports about the preventive and supportive factors for studies largely complemented the quantitative results. All in all, study motivation and appropriate distance learning completion method emerged as the most critical factors teachers can affect in designing their distance learning courses. As the most effective measure supporting study engagement may be fostering motivation by designing appropriately motivating distance learning completion methods, we will discuss these countermeasures most extensively below.

Interestingly, in our study, difficulty level or lack of academic skills became critically risky not earlier than at the last stages of course completion, at which the students may already be too passive in seeking support (Maunula et al., 2021). Alternatively, they may not be aware of their skill deficiencies before assessment. For example, at our institute, students are required to use complex citation systems even in time pressured and time limited electronic exams, using of which elicits exam anxiety in students (Dikmen, 2022), and they may not early enough realise the academic competency required for completion. Student profiling charting the academic skill level and targeted support measures, in the form of educational and technical support (Gaytan, 2015; Muljana & Luo, 2019), might prevent course dropouts at this stage. Low student preparedness can be counteracted by offering the students preparatory modules in the learning environment, or orientation courses (EADTU, 2024, ch. 3).

The challenge of Finnish open university education has traditionally been poor availability of teaching materials due to large numbers of students, although

digitalisation and e-learning materials have alleviated the challenge. The curricula of the Open University are based on those of degree students. The curricula designers cannot always reconcile the need extent with sufficient availability of learning materials, especially in open distance learning, which can significantly affect the amount of funding for the universities. Opting for open access online textbooks as course material may be one effective way of alleviating inaccessibility of course materials.

Fostering study motivation by completion method design

Motivation emerged as one of the two most important course completion risk factors in our study, as in other corresponding studies from our country (Maunula et al. 2021; Pekkala, 2004; Repo et al., 2014; Törmä et al., 2012). High learning motivation has been observed to support high individual student persistence in academic learning (Vansteenkiste et al., 2006). Engagement to learning and practice is generally seen as a result specifically of intrinsic motivation, for example, in the fields of sports psychology (e.g. Leyton-Roman et al., 2021) as well as work and organisational psychology (e.g. Meyer et al., 2004). In addition, intrinsic motivation supports academic performance and achievement, potentially mediated by study engagement and student persistence (Smit et al., 2017).

Although motivation and completion method are relatively independent course completion risk factors, designing appropriately motivating distance learning completion methods may be the most effective motivation fostering factor. Completion methods are primarily accurate measures of academic performance, but at best they also support learning, study performance and motivation. The adequacy of completion methods may be individual learner relative, and our qualitative results suggest flexible and alternative completion methods and increased social interaction could engage the students the most effectively to their studies (Elibol & Bozkurt, 2023). Most students desired time-flexible completion methods in their responses. Nevertheless, time-challenging completion methods, such as exams, are best suited to those who wish to progress rapidly in their studies. Using parallel alternative and flexible completion methods might lead to increased teacher workload and reduced assessment coherence, but the gain could be increased study engagement in distance learning. Flexibility and personalisation can be increased by offering students different completion methods based on their preparedness level: dividing tasks into subtasks with formative feedback in between for novice students,

and one-off exams for advanced students wanting to progress faster with their studies. Allowing students to align their assignment topic to their personal interest or work life skills could effectively engage the students to completion (Johansen et al., 2023).

We will further explore our results and developing study engagement support measures from a more psychological perspective using an influential psychological theory of motivation and motivational phenomena: the self-determination theory (Ryan & Deci, 2017, 2020), and it has been successfully applied with the same purpose (e.g. Chiu, 2021; Hsu et al., 2019). The theory distinguishes three levels of motivation: 1. autonomous intrinsic motivation, for practicing an activity for its own sake and pleasure, 2. controlled external motivation based on external rewards, and 3. amotivation or lack of motivation (Deci & Ryan, 2000). We focus on autonomous intrinsic motivation, as it is in the theory the most relevant and effective motivation form for persistence in studies. According to this view, behaviour is intrinsically motivated by potential and actual satisfaction of three basic psychological needs: 1. autonomy, 2. competence, and 3. relatedness or sense of belonging (Ryan & Deci, 2017, 2020). The greater the need satisfaction level, the greater the intrinsic motivation level to an activity (Hope et al., 2019). Moreover, motivation triggers self-efficacy (Duchatelet & Donche, 2019), cognitive engagement (Walker et al., 2006), and engagement to an activity (Bryan & Solomon, 2018).

Emotions are tightly linked with motivation (e.g. Løvoll et al., 2017). Some emotions, such as curiosity, trigger approach motivation and engagement to an activity, and some, like anxiety, induce avoidance motivation towards an activity (Muis et al., 2015). For example, test anxiety elevates dropout risk levels in distance studies (Dikmen, 2022). Applied to learning processes, intrinsic motivation can be identified at the emotional level with curiosity. Curiosity supports learning at the cognitive level (e.g. Camacho-Morles et al., 2021; Muis et al., 2015), and is neurally reflected in more efficient memory trace formation (Duan et al., 2020; Kang et al., 2009). Emotions promoting approach motivation should be cultivated (Camacho-Morles et al., 2021), as these also lead to optimal learning strategies and deeper learning (Muis et al., 2015), and these emotions are important to consider in designing completion methods for digital distance learning: an appropriate completion method supports approach motivation and emotions and guides the students to use appropriate study and learning strategies facilitates this process (Dunlovsky et al., 2013). Developing completion methods supporting these emotions also would foster

and maintain motivation levels, for example, dividing studies over a longer period. The instructor should show sensitivity to the students' emotional state in support and feedback (Patel et al., 2023). Neglecting students' emotional needs in this regard could potentially harm learning outcomes (Chen & Jang, 2010). Completion methods could involve frequent testing with continuous feedback and assessment, guiding and motivating students' learning (Roediger III et al., 2011). Moreover, testing and retesting could alleviate the test anxiety related to one-off exams.

As responses to open questions, students reported cherishing assessment and written feedback from the teacher, which nourishes feelings of competence and achievement, and effectively supports study motivation (Camacho-Morles et al., 2021); in the literature, student–instructor interaction (Gaytan, 2015; Shikulo & Lekhetho, 2020; Sorensen & Donovan, 2017), its quality (Stone & O'Shea, 2019) and the instructors' qualifications are associated with course completion efficacy (Thistoll & Yates, 2016). A social setting facilitates learning (Alqurashi, 2019; Kuo et al., 2014; Yuan & Kim, 2014), and peer group interaction arousing a sense of communal belonging is a strong motivational factor. In designing frequent testing, it is important to keep in mind that implementing group quizzes further motivates the students (Putnam et al., 2016), and facilitates motivational regulation development (Won et al., 2017). A sense of relatedness (Ryan & Deci, 2018) can be increased not only by teacher support and social interaction on discussion forums, group assignments or peer assessment, but perhaps the most effectively using interactive study materials (Kuo et al., 2014).

Limitations

There are a few limitations to our study. First, it was carried out only with psychology students; the stage-specific dynamics of risk factors revealed by the present study may differ in other subjects from the ones found in the present sample. Second, the results probably reflect problems inherent in the national higher education system, and those elsewhere may differ (see, e.g. Aydin et al., 2019). Larger studies are needed to draw generalised conclusions. Third, it is not infrequent in open higher education that students enroll into a course out of curiosity and without intention of completion (Kember, 1995), for example, in MOOCs, suffering from great numbers of dropout students. Nevertheless, we did not consider this dimension of study engagement here. Furthermore, it is probable that the data were biased towards the more achieved than average students: 28%

of the students in our sample reported non-completion of one or more courses, while the actual non-completion rate is about 40%. Although personalisation is important for course design, we did not include individual temperamental or other psychophysiological variables in our study, and furthermore, targeted studies are required to uncover the potential effects of individual features on course completion (e.g. Ertem & Gokalp, 2022). Finally, we neglected a potential preventive factor of student dropout that is self-efficacy or self-regulation capacity (Lee et al., 2013; Daumiller et al., 2023), which is typically interrelated with emotions (Asikainen et al., 2017) and motivation (Smit et al., 2017), and an important determinant of student satisfaction (Lysitsa & Mavroeidis, 2024). Nevertheless, motivation predicts most of the study engagement and significantly study performance (e.g. Froiland & Worrell, 2016); motivational regulation does not directly affect performance, so its effect is probably complex (see, e.g. Schwinger et al., 2009). As our questionnaire did not probe this important factor, so its potential direct and indirect impacts must be left for further studies.

Conclusions

In conclusion, study engagement remains a critical issue for open higher education distance e-learning. Responding to the evolving societal needs, study degrees and in-service training are under pressure to serve work life more directly than before. Higher education professionals strive to design shorter study and degree formats, for example, in the form of micro-credentials (Lauder & Mayhew, 2020), offered in the form of scalable distance learning courses. Maunula et al. (2021) emphasised the need for continuous learning and the decline in study engagement in digitised distance learning being a major challenge for these studies. All this highlights the significance of engaging course and instructional design that supports students' wellbeing and autonomous learning (Hachey et al., 2023; Lysitsa & Mavroeidis, 2024; Rahmani et al., 2024), especially in open higher education distance e-learning for adult students that value autonomy (Chu & Tsai, 2009). Proficiency in online course design also increases instructor satisfaction and protects instructors from burnout (Yang & Du, 2024). Based on our results, study engagement risk factors differ across course completion stages, and this result is critical for counteracting these factors by engaging course design. Countermeasures should target inspiring and fostering motivation and motivational regulation by designing appropriate learning and completion methods. This

could be implemented by creating a communal learning environment with increased testing and instructor and peer feedback, as well as flexibility in completion and study methods.

Conflicts of Interest

We have no known conflict of interest to disclose.

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