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**| RESEARCH ARTICLE**

**Predictors of Supervisor's Support for Students Writing their Undergraduate Dissertations in Moroccan Open-Access Higher Education Institutions**

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**| ABSTRACT**

With Higher Education (HE) rapidly changing, Moroccan supervisors of undergraduate dissertations adopted online technologies in technology-impooverished open-access institutions. Online supervision, however, is hardly studied in educational settings facing technological adversities in terms of infrastructure and training, nor is the topic researched for what it tells about the supervisor's role and the level of support students receive in such contexts. Using a regression model from questionnaire data (N = 90), the present work seeks to understand how supervisors' role links to the support they receive from their institutions, the number of supervisees, their technological pedagogical competence, and their perception of the academic skills of students. Technological-pedagogical competence, the number of supervisees, and supervisors' perceptions of students' academic skills largely determine how supervisors fulfil their roles. In contrast, institutional support in terms of training and technology infrastructure seems unrelated to the process. The present work suggests a few ways UD supervision can be more effective and calls for a more in-depth understanding of all the factors that affect supervision and teaching practices in general before making decisions that will affect higher education in the future. The issue is of paramount importance as the country is poised to reform undergraduate programs and institutionalize distance learning in post-pandemic Higher Education.

**| KEYWORDS**

Supervision, Undergraduate dissertation, Technological competence, Institutional support, Open-access institutions, Regression

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**1. Introduction**

Undergraduate Dissertation (UD) supervision has been documented extensively both in online and on-campus settings (Feather et al., 2014; Mateo et al., 2012; Roberts & Seaman, 2018; Rowley, 2000; Stefani et al., 1997; Strebelt et al., 2019; Zeddari, 2018). Rowley and Slack (2004, p. 176) state that the dissertation constitutes a "unique opportunity for independent learning and knowledge acquisition" that is supposed to prepare students for postgraduate research. Research has recently focused on students' and supervisors' perspectives on educational and psychological support in digitally saturated environments, in postgraduate and undergraduate programs alike (Dowling & Wilson, 2015; Gray & Crosta, 2018; Nasiri & Mafakheri, 2014). In less digitally equipped countries at the heart of the recent pandemic, UD supervisory processes seemed erratic and, for supervisors, were characterized by cycles of 'chaos' (Todd et al., 2006) that affected students as well.

Pandemic literature largely focuses on students (Alkhwaja et al., 2021; Le et al., 2021; Reflianto et al., 2021). Research on the effect of the pandemic on the UD is scarce, if not absent. In Morocco, the recent pandemic has cut in the middle of a planned reform by the Moroccan Ministère de L'Éducation Nationale (MEN) to institutionalize fully online learning in HE (MEN, 2020a). As such, the Moroccan context is ideal for studying UD supervision in an 'emergency remote teaching' context (Hodge et al., 2020) that is metamorphosing into established online education. Within the new paradigm of technology-enhanced HE, the National Pedagogical Norms published by the ministry emphasize the role of the undergraduate dissertation (MEN, 2020d), but the

modalities and resources, digital or otherwise, are left to the discretion of individual institutions that lack enough funding to update their infrastructure and human resources. Considering the structural constraints on Moroccan HE and the importance of institutional support for supervisors (Carlisle et al., 2017), the present paper aims to investigate the effect of these factors in predicting the level of support UD dissertation supervisors give their students.

## **2. Literature Review**

### **2.1. The Moroccan higher education context**

HE in Morocco is the state's responsibility (Fawbar, 2009). The Conseil Supérieur de l'Éducation, de la Formation et de la Recherche Scientifique (CSEFRS) distinguishes between open-access institutions (OAls) for everybody with a High School Certificate and closed-access institutions (COAs) that are selective (CSEFRS, 2018). In 2003, Morocco adopted the Licence-Master-Doctorat system only partly in OAls (Benchenna, 2009), which are overpopulated and understaffed institutions. (CSEFRS, 2018; Ghouati, 2010). In the school year of 2019-2020, for example, OAls comprised a total number of 61 faculties with a combined number of students reaching 800 492 against 81 schools for CAIs with only 121 452 students. In OAls, undergraduate students constitute more than 91% of the total number of students. The faculties of law and the social sciences and those of the human sciences received more than 85% of the newly enrolled students, 61 298 and 30089, respectively, against only 15936 students for the faculties of science in 2019 (MEN, 2020b, 2020c).

The Ministry of Higher Education is now poised to use the Bachelor system for the current one (MEN, 2020d). The new system, with four years of undergraduate studies instead of three, institutionalizes online learning and encourages the development of skills necessary for auto-learning. The UD is given yet a more prominent place within an integrated model that seeks to expand the programs offered in response to increasing demands for efficiency, the challenges of globalization, and the socio-economic needs of the country (CSEFRS, 2019). However, the proposed reform has met considerable resistance coming, especially from university professors. Among the many points of disagreement is the institutionalization of online education in OAls. Many teachers point to the lack of basic infrastructure, the inadequacy of teachers' support, and the absence of staff qualified to deal with any new responsibilities likely to be imposed by the online modalities of teaching (Lakhdar, 2020). Thus, macro and micro-structural challenges face the institutionalization of online learning and technology adoption in OAls (Sidir & Benchenna, 2008; Zeddari, 2018).

Within this general context, three challenges directly bear on the role of the UD supervisor. The first is the ratio of students to supervisors. The total number of full-time teachers is 8665 and 6182, and the average ratio of teacher to student is 1:57 and 1:19 in OAls and CAIs, respectively (CSEFRS, 2018). Thus, whereas the ratio in the former is well below the international level of 1:25, it is very high in the latter (CSEFRS, 2020). Another factor is that OAls have a large number of near-retirement staff, as 41% of the total number of professors are senior professors, according to a report by The Conseil Supérieur de l'Enseignement (CES) (Conseil Supérieur de l'Enseignement, 2008). Senior professors have reduced responsibilities at the undergraduate level and a relatively decreasing interest in technological tools. Consequently, professors in the lower ranks end up taking up the bulk of UD students. With dozens of students to supervise, young supervisors might find it hard to provide quality supervision even with good technological competence. The third factor is the number of students that keeps accumulating over the years. In the case of the 2009-2010 cohort, for example, students who graduated after one extra year constituted 9.9%, those after two years 7.9%, and those who were still enrolled in 2017 – 5 years after their first enrollment – was 5.9% (CSEFRS, 2018). In other words, students with at least one-year lag constituted up to 23.7 of the total number of students enrolled in 2017. The Covid-19 pandemic in 2020 added to the routine tasks of teaching and supervising the need to do them online, and this was at a time when many university teachers were still unconvinced of the utility of online teaching in OAls.

### **2.2. The role of the supervisor and digital competence**

The literature on undergraduate thesis supervision stresses the importance of the two key aspects of academic and psychological support (Cook, 1980; Jamieson & Gray, 2006; Roberts & Seaman, 2018; Rowley, 2000; Rowley & Slack, 2004; Strelbel et al., 2019). Academic support generally refers to assistance in setting clear objectives and a clear methodological framework. Academic support is also supposed to foster logical and critical writing (Smith et al., 2009). Psychological support requires that supervisors maintain rapport and motivation at a healthy level throughout the project (Gray & Crosta, 2018; Smith et al., 2009; Stefani et al., 1997; Todd et al., 2006).

Supervision styles differ in the extent to which these overarching roles and the specific task they require are implemented. Some supervisors interviewed by Holmberg (2006) considered themselves coaches, others more like consultants, and yet others saw their role as similar to parenting. Jamieson and Gray also identified (2006) differences in how supervisors rated different aspects related to supervision style, but they noted that students' and supervisors' expectations did generally match. Similarly, Stefani et al. (1997) observed that students tended to agree on the kind of support they wanted, but supervisors seemed to have varied and different

expectations. Students in del Rio et al.'s (2018) study saw the supervisor as a guide, editor-proofreader, and motivator. The differences in supervision styles and expectations reflect perhaps what Roberts and Seaman refer to as "the localized nature of undergraduate dissertation supervision within disciplines." (2018, p. 29), which in turn possibly ushers to the differences in goals and priorities (Holmberg, 2006). Alternatively, it might also be a reflection of the perceived tension between support and autonomy widely recognized in the literature (Anderson et al., 2006; Gray & Crosta, 2018; MacKeogh, 2006; Mainhard et al., 2009; Maxwell & Smyth, 2010; Strebel et al., 2019).

In addition to the type of support, the specific tasks of the supervisor were also studied extensively in on-campus and online settings alike (Stefani et al., 1997). These include support with the different stages of the thesis (Heinze & Heinze, 2009), interaction (Agricola et al., 2020), and written feedback (Adamson & Coulson, 2019; Hoomanfarid et al., 2018). Mateo et al. (2012) identified five key stages of US supervision: topic selection, planning and development, delivery and presentation, evaluation, recommendations and orientation. Strebel et al. (2019) found a positive impact of support during the 'road mapping' and methodology stages on the final grade. On the role of interaction, Smith, Todd, and Waldman (2009) report that students prefer a combination of written feedback on their drafts that is made "more real" through discussion-interaction (p. 17). For the interaction part in remote settings, Sussex (2008) suggested the use of both synchronous and asynchronous tools for congeniality where the normal ties that exist in on-campus supervision are severed through distance. For feedback on cloud-based shared files, Augustsson & Jaldemar (2014) observed that supervisors offer different types of feedback (comments, points of view, instructions, and questions) for different purposes (recommendation, development, or problematization) throughout the process.

Research has also focused on the affordances technology has to facilitate support (Gray & Crosta, 2018; Sussex, 2008). Heinze and Heinze (2009) suggest that technological channels can replace face-to-face interaction and note the frequent use of emails for academic support and the less frequent use of telephone conversations for psychological support. In dos Santos and Cechinel's (2019) study of online supervision, forums were preferred over chat overall, but the purposes for which both were used did not differ significantly. Students and supervisors use forums for academic discussions because the latter requires more time for reflection and critical thinking. For the channel itself, Sussex (2008) categorized technological tools according to interaction mode (asynchronous vs synchronous), type of interaction (written vs audio and video), and technology (IT-assisted vs Non-IT-assisted). Although Sussex discussed the use of technology for postgraduate research, plus the fact that some tools he mentioned are now outdated, the dimensions he introduced are useful for making sense of online UD supervision practices with the possibilities of Web 2.0 and 3.0 (Dowling & Wilson, 2015; Gray & Crosta, 2018).

### **2.3. The research question**

Because of the recent pandemic, online supervision was new to a substantial majority of Moroccan university teachers in OAls. In addition, OAls are generally known for their overall low quality in terms of academic performance and for their lack of inadequate technological infrastructure necessary for online supervision. In light of these facts, the present paper seeks to understand the UD supervision during the lock-down by answering the following research question: Can institutional support for the supervisor, their technological pedagogical competence, their perception of students' academic skills, and the number of supervisees they have predicted how they fulfil their supervisory roles?

## **3. Methodology**

### **3.1. Participants**

Soon after a piloting survey (N = 18), the Human Resources Departments of three universities were contracted to obtain the institutional email addresses of current professors in their OAls. Using the software G\*power (version 3.1.9.6), a priori power analysis for an F test (power = 0.80,  $f^2 = 0.12$ ,  $\alpha = 0.05$ , predictors = 4) suggested a sample size of 105 participants. For the individual predictors, the power analysis suggested a total sample size of 81 respondents. The initial target was then to recruit a sample of 110 participants, with roughly 20% females, to mirror the gender composition of the population (MEN, 2020b).

The data frame consisted of a list of the institutional emails of all the professors in the faculties of letters and the human sciences. We sent the questionnaire to 400 randomly selected participants (300 males and 100 females). Of these, 96 (females = 54 and males = 42) returned the questionnaire (24% return rate). Though unbalanced in terms of gender, the number of responses was encouraging, given the fact that a substantial number of Moroccan university professors do not use their academic emails at all or use them only sporadically. A second invitation resulted in an increase of the sample size by seven, and a third invitation added five more responses.

Of the total 108 responses, 12 were removed because the participants answered less than 50% of the items in the questionnaire. An additional 6 respondents were also removed following data screening. This left us with a total sample size of  $n = 90$ .

**3.2. Instrumentation**

The questionnaire was developed and refined to measure the four predictors as well as the response variable. Sections A and B of the questionnaire together comprised a set of 21 items on different aspects of the variables in question. Section C collected demographic information about the gender of the supervisor and the number of supervisees. Initially, the variable number of supervisees included four categories (less than 10, 11-25, 26-40, and more than 40) but was subsequently recoded to just two ('less than 25' and 'more than 25') since the number of participants in the third and fourth categories was relatively small. The researchers wrote the items for the four variables in the study. We selected them from a pool of items developed under the supervision of a domain expert after an extensive review of the literature.

Institutional support for the supervisor (items 1-4) addressed the level of institutional support in terms of providing technology infrastructure (training, material, and services) in addition to sponsoring supervisor-initiated training outside one's institution. The variable student's research skills (items 5-8) included skills in academic writing, knowledge of research methodology, auto-learning, and skills in using the internet for research. The variable of overall supervisor's support (items 9-15 in section B) addressed the educational as well the affiliative roles of the supervisor.

Operationalizing the variable supervisor's technological competence for UD supervision was somewhat difficult. Spante et al. (2018) conducted a systematic review of the literature on digital competence and found that its definition is ambiguous. Often technology use is subsumed under a comprehensive concept of digital competence (Ala-Mutka et al., 2008; European Commission, 2013) that encompasses abilities, skills, and attitudes required for a range of teaching tasks larger than the task of supervision (Madsen et al., 2018; Sánchez et al., 2019). In the literature, the TAM and TPACK models are widely used, but whereas the first is largely on technology use intention (Scherer et al., 2019), TPACK has been designed for technology adoption in classroom settings (Kurt, 2018). Krumsvik's model (2014) was more suitable to the purposes of the present work, as was his definition of teacher technological pedagogical competence as ICT use "with good pedagogical judgment and his/her awareness of its implications for learning strategies" and for students' "digital Bildung" (Krumsvik, 2014, p. 274). Krumsvik's model emphasizes the role of teachers' self-awareness of their proficiency in and appropriation of ICT use regardless of the setting and the subject matter. As such, his definition is apposite to the technological-pedagogical competence subscale of Archambault and Crippen's (2009) TPACK survey since the technological pedagogical subscale concerns the interaction of pedagogy and technology regardless of content. Archambault and Crippen's items and Krumsvik's definition were used to write the items for the supervisor's technological pedagogical competence variable (items 18-21).

**3.3. Data Analysis**

Data were initially screened for univariate outliers using Wilcox's (Wilcox, 2017) recommended MAD-median rule and later for multivariate outliers. Exploratory factor analysis was used for variable reduction and validity. Initially, Revelle and Rocklin's (1979) Very Simple Structure Factor was used to determine the optimal number of factors and suggested four factors as the best fit for the data. This number was then manually entered in factor analysis using oblique rotation, which resulted in the dropping of item 13 (I used plagiarism detection software). For all the other items, no factor loading was lower than 0.4 on the factor. A non-refined average score for each factor was then computed as these preserve the interpretation of the original scale (DiStefano et al., 2009)). Table 1 summarizes the factor loadings for the items retained for each variable as well as the reliability scores using Cronbach's alpha. The questionnaire was distributed in Arabic, and no equivalence is established between the original version and the one given below.

**Table 1: Factor Loadings for the Four variables (Cronbach alpha)**

Items	Factor loadings
<b>Institutional support for the supervisor (0.662)</b>	
1. My institution did not offer training that helps me in supervision	0.49
2. The materials that my institution provided for supervision were enough to do online supervision	0.68
3. The web services my institution provided were enough to do online supervision	0.79
4. My institution did not sponsor individual initiatives for supervision training	0.50
<b>Students' research skills (0.886)</b>	
5. My supervisees had good academic writing skills.	0.68
6. My supervisees had skills in using the scientific method in research	0.78

Items	Factor loadings
Institutional support for the supervisor (0.662)	
7. My supervisees were capable of auto-learning.	0.91
8. Students ethically use the web for academic purposes.	0.89
Supervisor overall support (0.849)	
9. I helped solve social and psychological problems that hindered the progress of students.	0.41
10. I motivated my students to complete their research.	0.72
11. I helped my students set goals for their research.	0.59
12. I helped my students in analyzing the data they collected.	0.70
14. I discussed research methodology with students.	0.79
15. I discussed time management and commitment with students.	0.79
16. I corrected all that students write, and I offer feedback	0.68
Supervisor's Technological pedagogical competence (0.813)	
17. I could easily create an online environment where students develop their skills and new knowledge.	0.53
18. I easily used different methods for distant supervision.	0.91
19. Moderating online interactions with students was something easy for me.	0.73
20. I encouraged interactivity among students using technology.	0.89

*Note. The applied rotation method is oblimin.*

The researchers tested several models using R (version 4.1.1). The psych package (2.1.9) was used for factor analysis and item analysis, and ggplot2 (3.3.5) and ggpubr (0.4.0) for the graphs. The leaps package (3.1) was used for the selection of the best predictive model. All the additive models with one, two, three, and four predictors were checked, and model selection was based on adjusted R<sup>2</sup>. Diagnostic analyses for outlier detection and multicollinearity were conducted after model selection. For the model selected, interaction terms were subsequently added, but none was statistically significant.

#### 4. Results and Discussion

Table 2 presents the means and standard deviation by a number of supervisees of the supervisor's overall support, institutional support for the supervisor, supervisor's perception of student's academic skills, and supervisor's technological-pedagogical competence. The results show that supervisors provided higher-than-average supervision support overall, regardless of the number of UD supervisees. Institutional support, in contrast, is lower than average regardless of the number of supervisees. Supervisors' perceptions of students' academic skills present a somewhat different pattern. Supervisors with less than 25 students give relatively lower scores for students on their academic skills than supervisors with more than 26 students and have higher scores on their technological pedagogical competence compared to supervisors with 26 students or more. Figure 1 better illustrates the differences in the variables by the number of supervisees.

**Table 2: Mean and standard deviation by number of supervisees**

Variable	Number of supervisees	M	SD
Supervisor's overall support	25 or less	5.50	1.03
	26 or more	5.63	1.35
Institutional support for supervisor	25 or less	4.23	1.144
	26 or more	4.30	1.41
Perceived academic skills of students	25 or less	3.94	1.52
	26 or more	4.29	1.459
Supervisor's technological pedagogical competence	25 or less	5.13	0.92
	26 or more	4.71	1.48

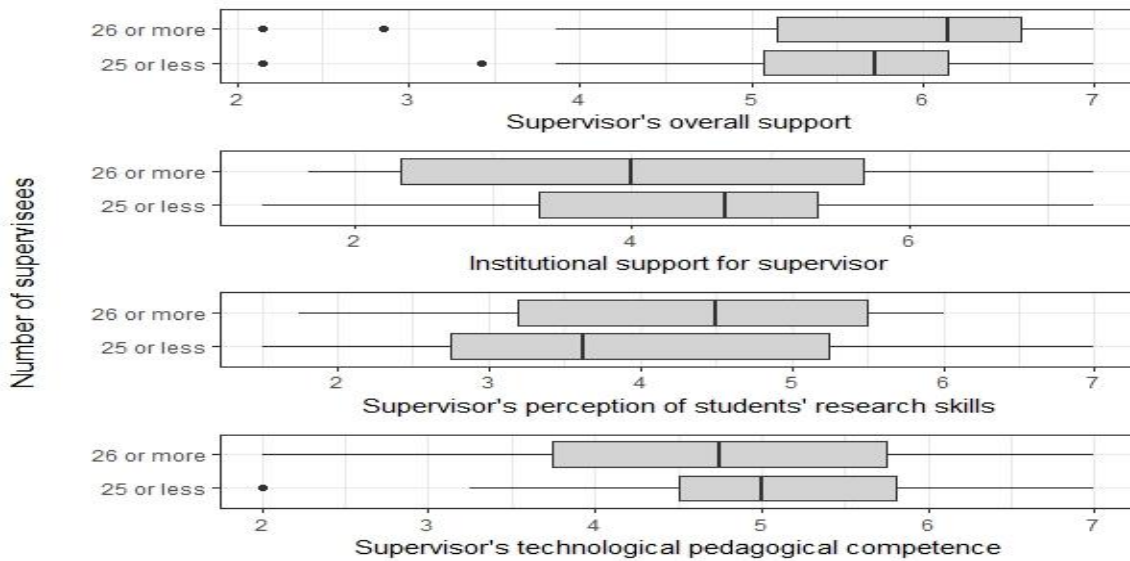


Figure 1: Variables scores by the number of supervisees

Table 3 presents the pairwise correlation of four continuous variables. There exists a moderate correlation between supervisors' overall support with perceived technological-pedagogical competence ( $r = 0.431$ ) and a weak correlation with the level of institutional support ( $r = 0.214$ ). Supervisors' overall support is negatively correlated with their perception of students' academic skills ( $-0.275$ ), but this correlation is weak. Interestingly, supervisors' technological pedagogical competence positively correlates with the perceived research skills of students ( $r = 0.259$ ).

**Table 3: Pearson's correlation between variables**

Variable	1	2	3	4
1. Overall support	—			
2. Supervisors' perception of students' academic skills	-0.27*	—		
3. Supervisor's Technological pedagogical competence	0.39***	0.32**	—	
4. Institutional support	0.21	-0.12	0.07	—

Table 4 presents a summary of the models retained from all the subsets of predictors. Supervisors' perception of students' academic skills was the best predictor using a model with one predictor ( $F = 13.69$ ,  $R^2_{adj} = 0.14$ ,  $p < .001$ ). The supervisor's perception of students' academic skills and the technological competence of the supervisor were the two best predictors in a two-parameter model ( $F = 17.18$ ,  $R^2_{adj} = 0.31$ ,  $p < .001$ ), and these plus number of supervisees were the three best predictors for a three-parameter model ( $F = 14.08$ ,  $R^2_{adj} = 0.35$ ,  $p < .001$ ). Institutional support was excluded from the final model since its effect was not significant ( $t = 0.875$ ,  $p = 0.39$ ).

**Table 4: Summary of subsets of models with 1, 2, 3, and 4 predictors**

Model	R <sup>2</sup>	R <sup>2</sup> <sub>adj</sub>	F	p	df1	df2
1. Supervisor's perceived research skills of students***	0.15	0.14	13.69	<.001	1	57
2. + Supervisor's technological pedagogical competence***	0.33	0.31	17.18	<.001	2	69
3. + Number***	0.38	0.35	14.08	<.001	3	68
4. + Institutional support	0.42	0.37	9.04	<.001	4	50

Following those results, a simple model with three predictors was chosen as the best model describing the data. This model, with the number of supervisees, technological pedagogical competence of supervisors, and supervisor's perception of students' academic skills as predictors, accounted for 35% of the variance in the level of overall support. Table 5 gives a summary of the final model.

**Table 5: Summary of the model retained**

Model	B	b	sd	T	P
Number	0.51	0.58	0.24	2.37	<.05
Supervisor's technological pedagogical competence	0.57	0.55	0.10	5.57	<.001
Perceived research skills of students	-0.52	-0.40	0.08	-4.90	<.001

The research question for this paper concerned whether the level of overall support (i.e., educational and affiliative support) could be predicted from their technological pedagogical competence, their perception of students' academic skills, the institutional support they receive, and the number of supervisees they had. The literature is unanimous on the pedagogical role of the supervisor in addition to the supervisor-supervisee relationship for the UD outcomes (Maor et al., 2016), but there is little research on how structural constraints link to the level of support supervisors provide, especially in UD. This is perhaps because such constraints are largely inexistant in institutions in developed countries, but they are known to affect developing countries where HE is a public service (Boikhutso et al., 2013). In the latter setting, supervision is conditioned on the support supervisors receive from their institutions, their technological-pedagogical skills, their perception of the supervisees' academic skills in addition to the number of UD students supervised, among other things.

Everything being equal, the overall support of the supervisor increases as their technological and pedagogical competence increases. However, there is little evidence that institutional support increases the technological pedagogical competence of supervisors. The literature emphasizes the role of the institution in supporting teachers' use of technology (Ismail, 2018), but time commitment to teaching and opening to change also affect technology adoption (Vannatta & Nancy, 2004). Supervisor scores on their perception of institutional support might reflect either true institutional support given by the institution, low perception of institution support (as in mass training that does not address the specific needs of supervisors or inadequate software), or lack of time commitment and opening to change that restricts its benefits. In Venkatesh and Bala's TAM model (2008), institutional support is a facilitating condition, with perceived usefulness and ease of use as crucial determinants of technology use. It is perhaps for those reasons that supervisors' technological pedagogical competence does not significantly correlate with institutional support, and the former better predicts the level of support supervisors give.

Supervisors' technological pedagogical competence aside, overall support decreases if the supervisor's perception of the level of supervisees increases, that is, if they judge that the student has the skills to do the task without too much reliance on the supervisor. The results are in line with findings that suggest that supervisors walk a fine line between providing too much and too little support (Agricola et al., 2020). If a supervisor deems students capable of auto-learning, then they might withhold from providing tips on time management, commitment, and motivation. Overall, the results point to a process of rationalizing the allocation of supervisory resources that is conditional on the larger structural constraints and individual decision-making on the part of the supervisor.

On the relationship between the number of supervisors and the quality of UD supervision, the literature is almost silent. In Morocco, supervisors do not generally control the number of supervisees they are assigned, which always depends on the number of faculty in addition to the number of students eligible for UD dissertation writing. In open-access institutions, the ratio of students to supervisors sometimes exceeds forty. Thus it might be the case that, having a large number of students, supervisors always end up giving more support in terms of quantity if not quality. This perhaps explains the positive link between the number of supervisees and the level of support given.

### **5. Limitations and Recommendations**

The present work enabled a glimpse at some factors related to UD supervision in open-access institutions. The model suggested captures a moderate part in the variation of supervisor's support, but a more comprehensive understanding can be gained with a rigorous model and larger sample size. For instance, technology acceptance in teaching is well-studied using the TAM and the TPACK models, and their predictive power is well-established (Scherer et al., 2015, 2019). In addition, attitudes towards both specific technological tools (cloud services and online conferencing) and the task of supervision might differentiate the quality and quantity of support. Thus, a full understanding of supervisors' attitudes towards UD dissertation towards specific technological tools is necessary for better predicting the use of technology in supervision.

In light of the limited work on UD supervision in the Moroccan context, the present paper has sought to understand this practice using a predictive regression model. To a limited extent, the results can inform several policies that might increase the efficiency of UD as a learning tool, the role of the supervisor, and the outcomes for students. First, institutional support can directly target teachers' attitudes towards technology to indirectly lead to more technology-informed UD supervision. The absence of a strong relationship between institutional support and the technological pedagogical competence of supervisors might be taken to mean that training and infrastructure might have little effect if teachers prefer safer technologies (emails to cloud-based technologies, for example). On the other hand, the strong correlation between supervisors' technological pedagogical competence and supervisors' support points to the crucial role of technology competence in the UD supervision process. For institutions with limited resources, therefore, it is perhaps more efficient to aim to reduce resistance to change and technology rather than offer training since it seems the case that, with the right attitudes, supervisors can and do seek training through personal efforts

Second, the results also show that structural constraints are related to the level of support supervisors give their students, and addressing these at the level departmental, faculty, or university level might be necessary. Different departments have different ways of allocating supervisees. Power and rank issues might decide how many supervisees one ends up with. To offset the impact of the number of students, it is recommended here that unified practices be put in place to at least ensure just procedures of supervisees' allocation and that good practices of supervision be institutionalized and rewarded at the undergraduate level. A just system can also ensure that administrators have a better idea of the supervisory burdens shared at departmental levels and allocate resources accordingly. However, since OALs are overcrowded institutions, the high ratio of students to teachers remains a perennial issue.

Concerning the high ratio of students to supervisors IOAs, it is recommended that writing centres be established. Students struggling with academic writing might be referred to these centres and take remedial courses even if they have validated formal courses on research methodology, writing, and study skills. After all, it is the limited impact of those courses – given their lecture-like nature in crowded lecture halls – that is generally responsible for their limited effect on students' skills. Also, engaging PhD students in the process of supervising, especially for correcting manuscripts and feedback on writing, might leave supervisors with more time to direct research-related problems like research design, data collection, and analysis. Focus on these areas by the supervisor will achieve the true aim of UD writing and alleviate some of the burdens on the supervisor in crowded departments.

### **6. Conclusion**

The recent-covid19 pandemic has accentuated a lot of the problems confronting UD writing and supervision, a task that is crucial for preparing students to research but usually lives on the fringes of teachers' responsibilities. In this paper, the objective was to examine some predictors of supervisors' support to students. To achieve this, a regression model was used to study how the number of supervisees, institutional support for supervisors, supervisors' technological-pedagogical, and supervisors' perception of students' academic skills were related to the level of support supervisors gave in 2020 when all tasks were done online. The results suggested that supervisors' perception of students' research skills, their pedagogical technological competence, and the number of students they have are the three best predictors of supervisors' support to students. One contribution the study makes, in addition to identifying some antecedents to UD supervisor's support, is that it enabled a glimpse at some variables that affect supervisors' roles and may be used to seriously probe the sources of supervision dysfunctionality in Moroccan OALs before making online education an integral part of the HE public service. The recommendations made in the section above may help increase



supervisors' support to students, but more variables require investigation before the process of UD supervision is fully understood. For example, other dimensions of the supervisor-student relationship may be examined, such as affiliation and control and students' perceptions of the role of supervisors. Also, other forms of institutional support to UD supervision, such as recognition of supervision workload, may have a positive effect on supervisors' support. Future research may examine the effect of these forms in addition to other contextual variables that bear on the work of the UD supervisor.

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