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Research article

Teachers' knowledge of soft skills and flipped classrooms: Nursing and health technologies

Jaouad Elkhalladi [a,*], Amal Sefrioui [b]

[a] Faculty of Medicine and Pharmacy, Mohamed 5 University, Rabat, Morocco
[b] Faculty of Dentistry, Mohamed 5 University, Rabat, Morocco

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ABSTRACT

Background: Soft skills and flipped classrooms are important in the fields of education, nursing, and health techniques.
Aim: This study determined nursing teachers' knowledge of soft skills and flipped classrooms.
Design: This was a descriptive cross-sectional study with an analytical focus involving 100 teachers.
Settings: The study was conducted at the Higher Institute of Nursing Professions and Health Techniques (ISPITS) at Agadir and its annex in Tiznit.
Participants: One hundred permanent and temporary teachers (with an equal distribution of male and female teachers) participated in the survey.
Methods: A five-part questionnaire was used to collect data. The independent variable was the use of a flipped classroom and dependent variable was the development of soft skills. SPSS version 25 software was used to process the data. Chi-square test, Ficher's test, binary logistic regression test, and multivariate logistic regression model were employed for data analysis.
Results: In total, 80 % participants had knowledge of soft skills, and 75 % knew about flipped classrooms. The most important soft skills were considered to be communication, stress management, teamwork, conflict management, problem-solving, time management, critical thinking, autonomy, adaptability, and decision-making. The five soft skills considered most likely to be developed by flipped classrooms were autonomy, analysis, teamwork, communication, and time management. Furthermore, the development of soft skills through the flipped classrooms was independently associated with soft skills training ($p = 0.008$) and use of flipped classrooms ($p = 0.042$).
Conclusions: Teachers have knowledge of soft skills and flipped classrooms despite a lack of training, and flipped classrooms contribute to the development of soft skills.

1. Introduction

Education is a crucial factor in the economic, social, and human progress of society that determines the availability of qualified and competent human resources. For decades, the education and training sector has undergone several reforms, both in Morocco and internationally, to meet the many challenges posed by technological development and the shortage of human resources, primarily through training and innovation in teaching.

* Corresponding author.
E-mail addresses: jaouadelkhalladi@gmail.com, jaouad.elkhalladi@um5.ac.ma (J. Elkhalladi), a.sefrioui@um5r.ac.ma (A. Sefrioui).

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The flipped classroom is a pedagogical method and strategy in education and training in general [1], medical education [2], and nursing in particular [3]. The sequence of lessons is maintained in flipped classrooms: students receive theoretical lectures and then carry out learning activities. with the main change being the context in which these activities are carried out. Theoretical explanations precede the session, while class time is devoted to problem-solving, in-depth understanding of concepts, and practical application of these concepts [4].

Recent literature emphasizes the importance of flipped classrooms in meeting educational reform needs, overcoming the shortcomings of current training programs, equipping healthcare professionals with the skills necessary for success, and keeping pace with the ever-changing world of work [5]. Teachers have a crucial role in reforming and improving the quality of teaching and developing the skills of future professionals by innovating and diversifying teaching methods, motivating students, creating an environment conducive to learning, and developing students' technical and non-technical skills.

These soft skills are skills and abilities necessary in the world of work in general and healthcare in particular [6]. Healthcare professionals need soft skills to adapt to changes in organizational structures, technological developments in the labour market, and accelerated competition [7]. They also need soft skills to ensure the safety and quality of patient care [8] and cope with professional pressure and stress [9]. Based on the importance of soft skills and flipped classrooms as a creative teaching strategy in the training of future healthcare professionals, this study examines nursing and healthcare technology teachers' knowledge of the importance of soft skills and flipped classrooms. Furthermore, we identify the most import soft skills in the health sector and investigate the development of soft skills through flipped classrooms.

2. Materials and methods

2.1. Study type

This descriptive, quantitative, and cross-sectional questionnaire study focused on teachers at the Higher Institute of Nursing Professions and Health Techniques (ISPITS) at Agadir and its annex in Tiznit to study and explore their knowledge of flipped classrooms and soft skills.

2.2. Data collection tool

The questionnaire we used for our research comprised three main parts. The first part concerned socio-demographic characteristics, including gender, age, experience, profile, academic level, and workplace. The second part concerned knowledge and training in soft skills, as well as the definition, importance, and need for training in soft skills. It also identified the soft skills that participants find the most important, and potential methods for acquiring and developing soft skills. The third part concerned the participants' knowledge of the flipped classroom method, type of flipped classroom training they have received, amount of time they have spent employing the method, duration of teaching support they received before the sessions, nature of this support before and during classroom sessions, soft skills that can be developed through flipped classrooms, and potential methods for acquiring and developing flipped classrooms.

The identification of the most important soft skills was calculated in order of importance using a 5-point Likert scale ranging from 'not important' to 'very important'. The calculation of Cronbach's alpha yielded a value of 0.912, indicating high measurement reliability.

The questions were checked by three participants who were excluded from the study: a professor in statistics and epidemiology, a professor in medical and nursing education, and a teacher in nursing education and soft skills. The aim of this process was to check the structure and clarity of the questions before they were distributed.

2.3. Participants

The participants in our study were permanent and temporary teachers at ISPITS in Agadir and its annex in Tiznit. The study was based on a survey of 116 teachers with a response rate of 86 %. Our sample of 100 participants comprised an equal distribution of 50 % females and males, 59 % of the participants were under 40 years of age, and 48 % had less than five years' experience. In addition, 62 % of the teachers in the sample were permanent, 40 % had a master's degree, 21 % were doctoral candidates, 19 % had a bachelor's degree, 18 % had a doctorate degree, and 2 % had a baccalaureate degree. In addition, most (85 %) taught at ISPITS in Agadir.

2.4. Variables

There were two main variables. The independent variable was the use of a flipped classroom, which was defined as a pedagogical strategy with online activities and in-class learning activities such as case studies, problem-solving, and application exercises. The dependent variable was the development of soft skills. Herein, soft skills were defined as non-technical competencies based on a non-exhaustive list of 37 skills developed from a literature review, focusing on the usefulness of soft skills in the field of nursing and health techniques, in Scopus and PubMed databases between 2014 and 2023.

2.5. Statistical tests

SPSS version 25 software was used to process the data. A bivariate analysis using the chi-square test and Fisher's exact test (when the number of observations was less than 5) was carried out between the dependent variable (development of soft skills through the flipped classroom) and other variables (gender, age, experience, profile, academic level, ISPITS, soft skills training, flipped classroom training, and use of flipped classrooms).

The multivariate logistic regression model was adjusted only for variables with a significant relationship ($p < 0.05$) with the dependent variable in bivariate analysis [10].

3. Results

3.1. Demographics

An equal numbers of the participants in our study (n = 100) were male and female, with 52 % being under 40 years of age. Many were recently recruited, with 48 % having been with the institute for less than five years. In addition, 62 % were permanent teachers, 40 % had a master's degree, 21 % were doctoral students, and 18 % had a doctorate. Most participants (85 %) taught at ISPITS Agadir, which can be explained by the large number of students and courses at ISPITS Agadir compared to its annex in Tiznit.

3.2. Soft skills

In total, 80 % of the participants had some knowledge of soft skills, but only 30 % had received training in this subject. Among those participants who had received training in soft skills, the average hourly duration was 30.61 h ±30.07, with 38.4 % in the form of continuous training.

Under the definition of soft skills, 26.9 % suggested human skills, followed by relational and social skills (26.2 %), and then non-technical skills (19.4 %). Further, 29 % of participants stated that soft skills are used to develop human skills, 27.8 % added that soft skills complement technical skills, and 22 % highlighted the importance of soft skills in improving working conditions. In addition, 65 % of the participants stated that they needed training in soft skills, and 29.1 % suggested continuous training as a means of acquiring and developing these skills.

According to the participants, the most important soft skills in the workplace are communication (99 %), stress management (99 %), teamwork (97 %), conflict management (95 %), problem-solving (94 %), time management (93 %), critical thinking (92 %), autonomy (92 %), adaptability (91 %), and decision-making (91 %).

3.3. Flipped classroom

In total, 75 % of the participants had some knowledge of flipped classrooms, but only 34 % had received training in this subject. Among those who were trained, the average hourly training duration was 25.13 h ±25.37; this training was primarily delivered as continuous training (37.2 %). Similarly, all participants said that flipped classrooms contribute to developing soft skills, either fully (60 %) or partially (40 %). These participants also suggested continuous training as the primary means of developing soft skills. According to the participants, the soft skills most likely to be developed by flipped classrooms were autonomy (57 %), analysis (49 %), teamwork (39 %), communication (36 %), time management (31 %), critical thinking (30 %), anticipation (25 %), problem-solving (24 %), responsibility (22 %), and creativity (20 %).

3.4. Univariate analysis

There was a significant relationship between soft skills knowledge and age ($p = 0.003$), experience ($p = 0.005$), profile ($p < 0.001$), academic level ($F = 0.001$), soft skills training ($p = 0.001$), and the need for soft skills training ($F = 0.017$). However, there was no significant relationship with gender ($p = 0.317$) or ISPITS ($F = 0.173$). There was also a significant relationship between knowledge of flipped classrooms and age ($p < 0.001$), experience ($p = 0.001$), profile ($p < 0.001$), academic level ($F = 0.000$), flipped classrooms training ($p < 0.001$), and flipped classroom use ($p < 0.001$). There was no significant relationship with gender ($p = 0.488$) or ISPITS ($F = 0.755$).

Table 1 shows the significant relationship between the development of soft skills through flipped classrooms and age ($p = 0.006$), experience ($p = 0.001$), profile ($p = 0.044$), academic level ($F = 0.017$), soft skills training ($p < 0.001$), flipped classrooms training ($p = 0.047$), and use of flipped classrooms ($p = 0.002$). There was no significant relationship with gender ($p = 0.683$), specialty ($F = 0.510$), and ISPITS ($F = 0.568$) (see Table 1).

3.5. Multivariate analysis

In the multivariate analysis, only training in soft skills and the use of flipped classrooms were independently associated with

Table 1
Bivariate analysis of the development of soft skills by flipped classrooms.

Variables		Development of SS by FC		p-value	
		Yes	Partially	χ^2 test	Fisher's exact test
Gender				0.683	–
	Male	29 (58.0 %)	21 (42.0 %)		
	Female	31 (62.0 %)	19 (38.0 %)		
Age (in years)				0.006*	–
	20–40	42 (71.2 %)	17 (28.8 %)		
	41–62	18 (43.9 %)	23 (56.1 %)		
Experience (in years)				0.001*	–
	1–5	37 (77.1 %)	11 (22.9 %)		
	6–43	23 (44.2 %)	29 (55.8 %)		
Profile				0.044*	–
	Permanent	42 (67.7 %)	20 (32.3 %)		
	Temporary	18 (47.4 %)	20 (52.6 %)		
Academic level				–	0.017*
	Bac	2 (100.0 %)	0		
	Bachelor	9 (47.4 %)	10 (52.6 %)		
	Master	30 (75.0 %)	10 (25.0 %)		
	Doctoral candidate	13 (61.9 %)	8 (38.1 %)		
	Doctorate	6 (33.3 %)	12 (66.7 %)		
ISPITS				–	0.568
	Agadir	52 (61.2 %)	33 (38.8 %)		
	Tiznit	8 (53.3 %)	7 (46.7 %)		
SS training				<0.001*	
	Yes	26 (86.7 %)	4 (13.3 %)		
	No	34 (48.6 %)	36 (51.4 %)		
FC training				0.047*	–
	Yes	25 (73.5 %)	9 (26.5 %)		
	No	35 (53.0 %)	31 (47.0 %)		
Use of FC				0.002*	–
	Yes	39 (75.0 %)	13 (25.0 %)		
	No	21 (44.7 %)	26 (55.3 %)		

Note. *$p < 0.05$; SS: soft skills; FC: flipped classroom; ISPITS: Higher Institute of Nursing Professions and Health Techniques.

Table 2
Logistic regression of the development of soft skills by flipped classrooms.

	B	p-value	OR	95 % confidence interval	
				Lower	Upper
SS training	1.955	0.008	7.065	1.664	29.996
Use of FC	1.163	0.042	3.198	1.045	9.791
Constant	23.369	0.999			

Note. B: Unstandardized regression weight; FC: Flipped classrooms; OR: Odds ratio; SS: Soft skills.

developing soft skills using flipped classrooms. The regression equation was soft skills development = 23.37 +(1.95 × soft skills training) + (1.16 × use of flipped classrooms) (see Table 2).

4. Discussion

Regarding the definition of soft skills, 26.9 % of the participants proposed this included human skills, followed by relational and social skills, then non-technical skills. These definitions align with the existing definitions of soft skills [11–13]. In terms of the importance of soft skills, the participants first chose the development of human skills, then complementarity with technical skills, and finally, the improvement of working conditions. Through interpersonal skills, soft skills significantly improve behaviour and relationships with others [14]. Therefore, there is a complementary relationship between technical and soft skills, which are equally important and should be assessed [15].

In this study, 65 % of the participants stated that they needed training in soft skills, confirming the lack of training in soft skills. In the same context, Tang [16] noted that an absence or decline in teacher performance is linked to the lack of acquisition of soft skills during their training in higher education. Moreover, according to the participants, the most important soft skills in the professional healthcare environment are communication, stress management, teamwork, conflict management, problem-solving, time management, critical thinking, autonomy, adaptability, and decision-making. The first three skills are the most in demand in healthcare [17,18] and other fields [19,20]. In a study in the field of management and administration, teachers stated that communication, teamwork, and critical thinking are the most important soft skills [16]. The least important soft skill in our study was entrepreneurship competence, despite its usefulness in providing care services [21]. Entrepreneurial skills could be more visibly important in other

areas, such as business or industry.

Regarding flipped classrooms, 75 % of participants knew the concept, whereas only 34 % of participants were trained in this subject. Several studies have demonstrated a general lack of training and knowledge in this teaching strategy [22]. Thus, the participants chose in-service training as the most important need (44.3 %) for developing flipped classrooms. According to an American study in the field of medicine, teachers are more satisfied with the use of flipped classrooms than with traditional methods, but several challenges still remain to be overcome, especially regarding creating educational content and facilitating learning activities [23]. Indeed, teachers have a crucial role to play in the success of flipped classrooms, especially regarding the activities programmed beforehand and the learning and application activities during the classroom session. Teachers must therefore design the course in line with the objectives, prepare activities and materials, support and guide the students outside and inside the classroom, and summarise and assess their learning [24] to develop students' technical and soft skills [25].

Similarly, all participants agreed that flipped classrooms contribute to developing soft skills, which encourages using this innovative teaching strategy for their acquisition and development. However, further studies, especially those with an experimental approach, are required to confirm these findings and identify other secondary factors that promote soft skills acquisition.

In addition, the 10 soft skills most likely to be developed by the flipped classrooms in nursing education were considered to be autonomy, analysis, teamwork, communication, time management, critical thinking, anticipation, problem-solving, responsibility, and creativity. This result aligns with those of other studies that have demonstrated the usefulness of flipped classrooms in developing specific soft skills, such as learners' autonomy. Learners become more autonomous, especially when viewing videos whenever they want, with the possibility of repetition, which reduces the teacher's control and gives students more autonomy [26]. Thus, the competence of responsibility is acquired [27], through which the learner becomes responsible for their learning through autonomy in consulting documentation and answering quizzes. This encourages them to participate in the activities programmed in the classroom and develop certain skills and attributes, such as team spirit [5] and critical thinking [28].

Furthermore, the multivariate analysis demonstrated that the development of soft skills through the flipped classrooms was independently associated with soft skills training ($p = 0.008$) and use of flipped classrooms ($p = 0.042$). Similarly, training is important for developing soft skills and should be integrated into the initial training program for healthcare professionals [6]. Soft skills training also plays a part in improving patient safety and the optimum performance of nursing practices [8]. In addition, using flipped classrooms helps develop specific soft skills, such as teamwork, problem-solving, and critical thinking [29].

Indeed, several studies have supported flipped classrooms' capacity to develop students' soft skills [30,31]. For example, Elkhalladi and Sefriouri [32] showed the impact of flipped classrooms in developing radiology students' soft skills including communication, stress management, decision-making, problem-solving, teamwork, and adaptability.

4.1. Limitations

This study was carried out in only two institutes and among teachers. Students were not included to determine their knowledge of soft skills, which could be important for a more comprehensive understanding of the field. Additionally, this is a quantitative study, which may have reduced the quality of the data regarding participants' perceptions of the flipped classrooms and soft skills. The lack of an experimental study to confirm the development of soft skills through the use of flipped classrooms should be noted.

Future research should gather further details regarding the use of flipped classrooms, especially the learning tools, activities, and platforms used, and assess students' motivation and commitment during the use of this teaching strategy. Future studies could also evaluate soft skills in teachers and students, and multicentre studies could be implemented to ensure the reliability and generalizability of the results.

5. Conclusion

This study explored the state of knowledge of nursing and health technology teachers regarding soft skills and their importance, as well the use and importance of such skills in flipped classrooms. The study also identified the most important soft skills in healthcare education and the possibility of developing soft skills through flipped classrooms.

Our study demonstrated that only 30 % of the participants had received soft skills training, and 95 % said they needed such training. The most important soft skills in the workplace were considered to be communication, stress management, teamwork, conflict management, problem-solving, time management, critical thinking, autonomy, adaptability, and decision-making.

Only 34 % of the participants had received flipped classroom training, and all thought that flipped classrooms contributed to developing soft skills, either fully or partially. The five soft skills most likely to be developed by flipped classrooms were autonomy, analysis, teamwork, communication, and time management. Furthermore, the development of soft skills through the flipped classrooms was independently associated with soft skills training ($p = 0.008$) and the use of the flipped classrooms ($p = 0.042$).

Our study answered the research question by confirming that flipped classrooms contribute to developing soft skills, determining the soft skills likely to be developed by this teaching strategy, and suggesting the factors that favour such development.

Data availability statement

The data associated with the study are available at https://zenodo.org/records/12530861.

Ethical statement

This study received approval from the ethics committee of Mohamed V University in Rabat (no. 39/22). Participation was voluntary, and participants were informed of the study's purpose and their right to withdraw without providing excuses. Data anonymity and confidentiality were ensured.

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CRediT authorship contribution statement

Jaouad Elkhalladi: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Amal Sefrioui:** Writing – original draft, Visualization, Validation, Supervision, Methodology, Conceptualization.

Declaration of competing interest

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.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2024.e35668.

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