



## Teachers' Knowledge of Hybrid Teaching Practiced during the COVID-19 Pandemic and its Effects on Student Achievement

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### Abstract

This study aimed to investigate the level of teachers' knowledge deemed necessary to meet the requirements of hybrid teaching during the Covid-19 pandemic. A descriptive quantitative approach was used in this study. A questionnaire was used as the tool for data collection; it was composed of three parts. The first part was designed to collect information on demographic characteristics, while the second part was used to collect information about teachers' knowledge of psychological education theories, teaching styles, IT and education tools. The third part aimed to collect information about the students' achievements based on teachers' views. A simple random sample of teachers was selected, comprising 1500 teachers from government schools. The validity and reliability of the questionnaire were measured. The study concluded that teachers had little knowledge about the basic requirements for hybrid teaching and what had been practiced was actually emergency remote teaching. The study recommended the adoption of hybrid teaching strategies nationally as a desired move to be applied and evaluated regularly.

**Keywords:** Hybrid teaching, Hybrid teaching knowledge, Psychological education knowledge, IT knowledge, Education tools knowledge, Teaching styles, Students achievement.

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**Ethical:** This study followed all ethical practices during writing.

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**Contribution of this paper to the literature**

Hybrid teaching requires the integrated skills of teachers. This paper pays attention to the levels of skills needed by teachers to practice hybrid teaching as a new important educational strategy.

**1. Introduction**

Education foundations show care in the nurturing of students’ bodies, spirit and mental capabilities in the long run (Turkkahraman, 2015; Ugurlu, 2016). In recent years, knowledge revolutions and attempts to follow in the footsteps of developed countries have become educational process targets (Carbonnier, Cardboard, & King, 2014; Nugba, 2021). The high speed of knowledge development especially in the IT sector has made it urgent for continuous efforts to meet these targets in developing societies (Hager et al., 2020). The COVID-19 pandemic was one of the causes for the increase in demand to improve knowledge, to meet the educational process needs in exceptional conditions (De Giusti, 2020). This called for adoption of new teaching strategies that ensure students’ needs are met in both face-to-face and online teaching processes.

The technological revolution together with the crises brought about by the pandemic raised the need for educational developments to meet the new needs, to change social and economic lifestyles and for innovations that meet the needs of new developments (Baki, 2022; Nguyen, 2015). The new developments in IT and their high speed called for changes in teachers’ skills and experiences, to meet these changes and to transfer this knowledge to the new generations of students (Turkkahraman, 2015). The ability to transfer knowledge to students using locally developed tools became the measure of educational success among countries. Also, the adoption of proper teaching strategies was seen as vital to help students meet their needs and to satisfy their preferences in both face-to-face and online learning.

Most countries aimed to improve the educational process by utilizing telecommunication tools and scientific development seen worldwide to change the curriculum and skills of teachers, to enable them to introduce these skills to students (Dangara, 2016). The COVID-19 pandemic showed that countries that were prepared technologically succeeded in continuing the teaching process using the new technologies and applying all available resources to ensure that the students benefitted from the educational process throughout the pandemic (Hager et al., 2020). The teacher is considered the core of the education process. Teachers are responsible for developing their skills in creativity and critical thinking, to transmit them to their students (UNESCO et al., 2016).

Despite the changes made in the teaching process, most countries did not modify procedures to follow up on the teaching process to complement those used in the traditional teaching methods. The follow up on teachers’ capabilities to provide both face-to-face and online teaching became essential to ensure that students received the required experience and information to meet the goals of the education stage. This research investigates the knowledge of teachers in the public education sector and its effects on the knowledge gained by students.

**2. Methodology**

*2.1 Research Problem and Objective*

Education is considered a complicated process faced by teachers under high pressure to use both types of teaching methods, face-to-face and online teaching. The teachers’ capabilities and the use of good and proper strategies are seen to facilitate the application of both teaching processes integrally. The strategies applied should consider the roles of both teachers and parents. The role of the school is considered crucial in following up on the success of the application of both types of teaching, for both students and parents.

The COVID-19 pandemic raised the need for educational skills for teachers to succeed in the teaching process and at the same time increased the role of parents to enhance students’ success in gaining education and achieving the right behavior in both face-to-face and online teaching and learning activities. Accordingly, the objective of this study is to measure teachers’ skills in both educational and physiological knowledge to meet students’ needs at the time of the COVID-19 pandemic. A further aim is to measure the extent of use of educational tools and styles to succeed in the education process throughout the COVID-19 pandemic.

*2.2. Research Variables*

Skills in education psychology, skills in teaching styles, follow up on education tools and IT enrichment in educational processes and their effects on the achievement of students are the variables observed in this study

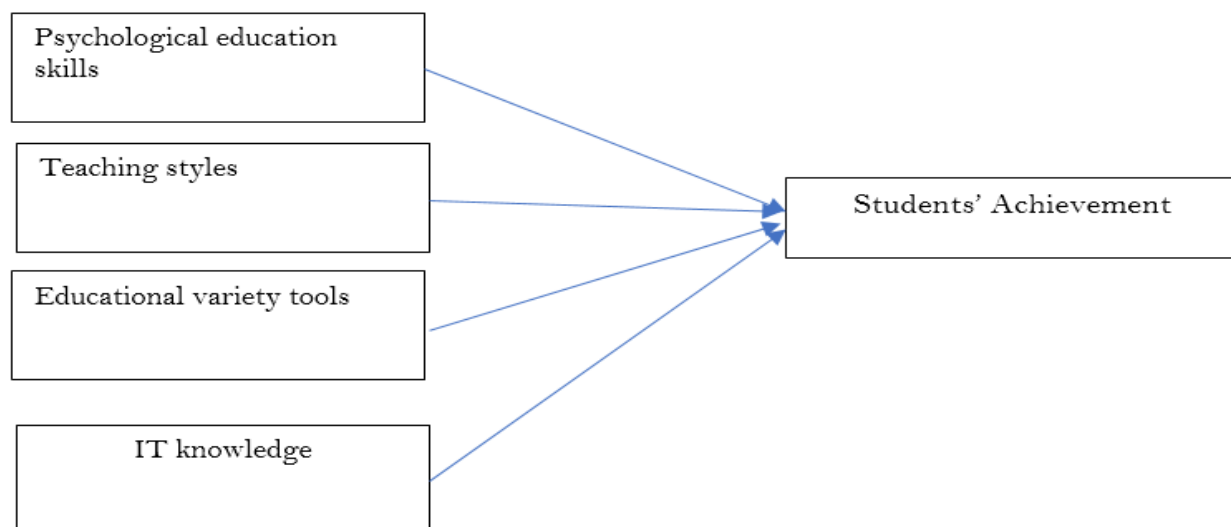


Figure 1. Research model.

Figure 1 explains the independent variables of the study which include psychological education, teaching styles, educational variety tools and IT knowledge and the dependent variable which is the students' achievement

### **2.3. Research Hypothesis**

The study examines the following hypotheses:

*Ho: There is no significant effect of teachers' psychological educational skills on students' achievement.*

*Ho: There is no significant effect of educational styles on students' achievement.*

*Ho: There is no significant effect of educational variety tools on students' achievement.*

*Ho: There is no significant effect of IT knowledge on students' achievement.*

### **2.4. Research Concepts**

Education is known as the process of building on something to reach its optimal stage. Also, it refers to the regular organization of the individual's experiences to gain the required skills and knowledge which enables him to stand in the social life of society (Braithwaite & Goldstone, 2015).

Hybrid teaching: is the teaching done face-to-face and online, that satisfies students' needs and education goals (Ora, Sahatcija, & Ferhataj, 2018).

Psychological education skills deal with how students learn; this includes the instructions and the consideration given to the individual differences among students (Cherry, 2022).

Teaching styles are the teaching strategies used by teachers to improve the learning activities and students' performances (Ridwan, Sutresna, & Haryeti, 2019).

Educational tools refer to the input in the teaching process that helps students understand scientific material (Kolb, Boyatzis, & Mainemelis, 2001).

IT knowledge of teachers refers to teachers using technology to run online teaching classes or explain different methods or ideas using videos or other tools (Joshi, Vinay, & Bhaskar, 2021).

### **2.5. Research Tool**

The study used the questionnaire as a tool to collect data. The questionnaire was composed of three parts. The first part collected information about the demographic characteristics of teachers and the capacity building of hybrid teaching, while the second part was designed to collect information about the teachers' psychological educational skills, teaching styles, educational tools and IT knowledge. The third part was designed to collect information about the students' achievements and progress when hybrid teaching was applied. A five-point Likert scale was used to measure the principal trends in teachers' knowledge.

### **2.6. Research Population and Sample**

The study population was composed of all public school teachers in KSA, which exceeded 120,000. Due to the difficulties faced in reaching the whole population, a simple random sample was used. The study sample included the teachers of public schools in the Eastern part of KSA. The sample of the study was composed of 1500 public school teachers. The questionnaire was distributed online.

### **2.7. Statistical Analysis**

The collected data were entered into SPSS (Ver 26) and two types of statistical analyses were used:

1. Descriptive statistics: Frequencies and percentages were calculated to measure the distribution of demographic characteristics among teachers and the capacity-building criteria, while means and standard deviations were used to measure the trends of knowledge the teachers possessed, based on the principals' views.
2. Inferential statistics: independent t-test was used to measure the teachers' knowledge of psychological education skills, teaching styles, IT knowledge and the effect of educational tools on students' achievement. Multiple regression procedures were used by applying the SEM model using STATA (Ver 24).

### **2.8. Ethical Considerations**

A consent letter was distributed to the school teachers to get their agreement to participate in this study. In addition, the introduction to the questionnaire contained a statement of agreement by the respondent to fill in the questionnaire.

## **3. Literature Review**

Hybrid teaching was a method applied in the past especially in public schools. The COVID-19 pandemic changed teaching practices and hybrid teaching came into big demand in the overall education field. The application of hybrid teaching became a necessity during the COVID-19 pandemic due to the exceptional conditions of health that stopped face-to-face education. Challenges faced in the educational process changed the views on hybrid teaching. Subsequently, teachers faced several difficulties related to the methods and strategies that should be applied in this type of teaching (JilardiDamavandi, Mahyuddin, Elias, Daud, & Shabani, 2011). The challenges faced were related to the education process itself and society's cooperation in handling this type of teaching. These challenges were faced in areas of teaching styles, psychological educational skills, educational tools that can be applied in both face-to-face and online teaching processes and the knowledge teachers have to deal with IT technology as teaching platforms or tools to prepare educational material.

### **3.1. Psychological Educational Skills**

The psychological theory of education cares about learners inside and outside the classroom. The theory considers different demographic characteristics of learners and social environments affecting the learning process (McInerney, 2005). The psychological theory is concerned with the different aspects that affect learners; it is concerned with cognitive and behavioral psychology, humanitarian aspects and the subjects related to social cognitive theory. Telyani, Farmanesh, and Zargar (2021) have shown that the move to online or hybrid teaching

came without previous arrangements during the COVID-19 pandemic. This move does not consider the simultaneous psychological effect on both students and teachers. Numerous research have shown that online teaching creates high stress for teachers, students and parents (Sareen & Nangia, 2020; Song, Wang, Espelage, Fenning, & Jimerson, 2022; Valadez et al., 2020). These empirical findings show the need for a revision in hybrid teaching for it to reach its optimal advantages to meet future needs.

Student support services have been dropped during online teaching. Moreover, the new learning environment of the students has created new types of stress, including family financial problems, social isolation and the lack of guidance for students to follow up on online learning (Browning et al., 2021; Golberstein, Wen, & Miller, 2020; Marashi, Nicholson, Ogrodnik, Fenesi, & Heisz, 2021). The negative effects include difficulties in students joining online lessons. This places additional pressure on families to solve these problems under financial stress. On the other hand, teachers face different types of stress related to pre-experience in managing psychological problems to help students manage these conditions, lack of training in this field and the low support that teachers receive from educational organizations and their schools (Mishra, Gupta, & Shree, 2020; Onyema et al., 2020; Tran et al., 2020). This study examines the steps taken by teachers to deal with psychological problems in hybrid teaching.

### *3.2. Teaching Styles*

In online teaching or hybrid teaching processes, teachers follow strategies used in traditional teaching methods. Despite the negative impact of traditional strategies on student achievement, teachers did not extend additional effort on finding more efficient strategies to help their students improve in their accomplishments (Mahmood, 2021; Onyema et al., 2020; Telyani et al., 2021). Despite the negative impact of the strategies used, local educational organizations did not execute any field research to study the impact of the strategies on students' achievement and the teachers' capabilities to design new ones to meet the online or hybrid teaching process (Ora et al., 2018; Sindiani et al., 2020).

Research interest in the proper strategies that should be applied in hybrid teaching increased, but the shortcomings continued in the application of the recommended strategies due to the lack of follow up among teachers and their low confidence in the efficiency of hybrid teaching (Nguyen, 2015; Ora et al., 2018). The continued use of hybrid teaching in the face of conditions that prevent face-to-face lessons raise the need to design suitable strategies that can be used by teachers to improve students' achievements.

### *3.3. Educational tools*

The traditional tools used in the teaching process may not fit the same objectives when used in hybrid teaching. Pokhrel and Chhetri (2021) explain some of the difficulties faced by teachers in the online teaching process. These difficulties are related to the accessibility of the different platforms used for online teaching. Most teachers face problems in accessing different teaching platforms in online teaching and managing these platforms to meet their needs in introducing the required material (Murgatrot, 2020).

Teachers in online teaching have tried to improve their use of educational tools by contacting each other and trying to find creative methods to introduce the educational material. The teachers try to cooperate to create effective tools that can be applied to improve the students' achievements with cooperation from parents (Doucet, Netolicky, Timmers, & Tuscano, 2020). This study investigates the capabilities of teachers to modify their educational tools to improve their students' achievements.

### *3.4. IT Knowledge*

Pokhrel and Chhetri (2021) explained the internet connection problems faced by governorates to meet the requirements of providing online teaching nationwide. These problems put teachers and students in trouble with the need to have a continuous educational process that satisfies the requirements of the national education policy. On the other hand, teachers also lack the knowledge to use different IT tools that help them to introduce themes and ideas to their students. Therefore, students suffer from the want of good and efficient internet connections to follow their lessons. The frequency of these problems and lack of good IT infrastructure lower the teachers' and students' interest in the online education process.

The need to use IT tools exceeded the experience needed to use the educational platforms; IT tools were needed to facilitate contacting students and their parents. However, the knowledge of teachers to use tools varied according to their previous experiences in using these tools. Most teachers or students did not receive any training to improve their ability to use the available IT tools for online teaching or hybrid teaching (Mishra et al., 2020).

## **4. Results**

### *4.1. Demographic Characteristics*

Figure 2 shows the demographic characteristics of teachers who participated in this research. The results show that female participation in this study was higher (51.9%) compared with (48.1%) males. Most of the participants were of middle age, ranging from 30 years to 50 years (61.0%). About 16.0% of the teachers were aged less than 30 years, while 23.0% of them were more than 50 years old. The majority of the sample had bachelor degrees (52.0%), while 43.0% of the sample had certificates in higher studies. The lowest number were from those with less than a bachelor's (5.0%). This small category worked in schools that had kindergartens. There were more teachers from the Arts stream in sample than the science stream with 30.0%, and the lowest number recorded was class teachers (25%). The class teachers were qualified to teach within the first three class levels in school. Figure 2.

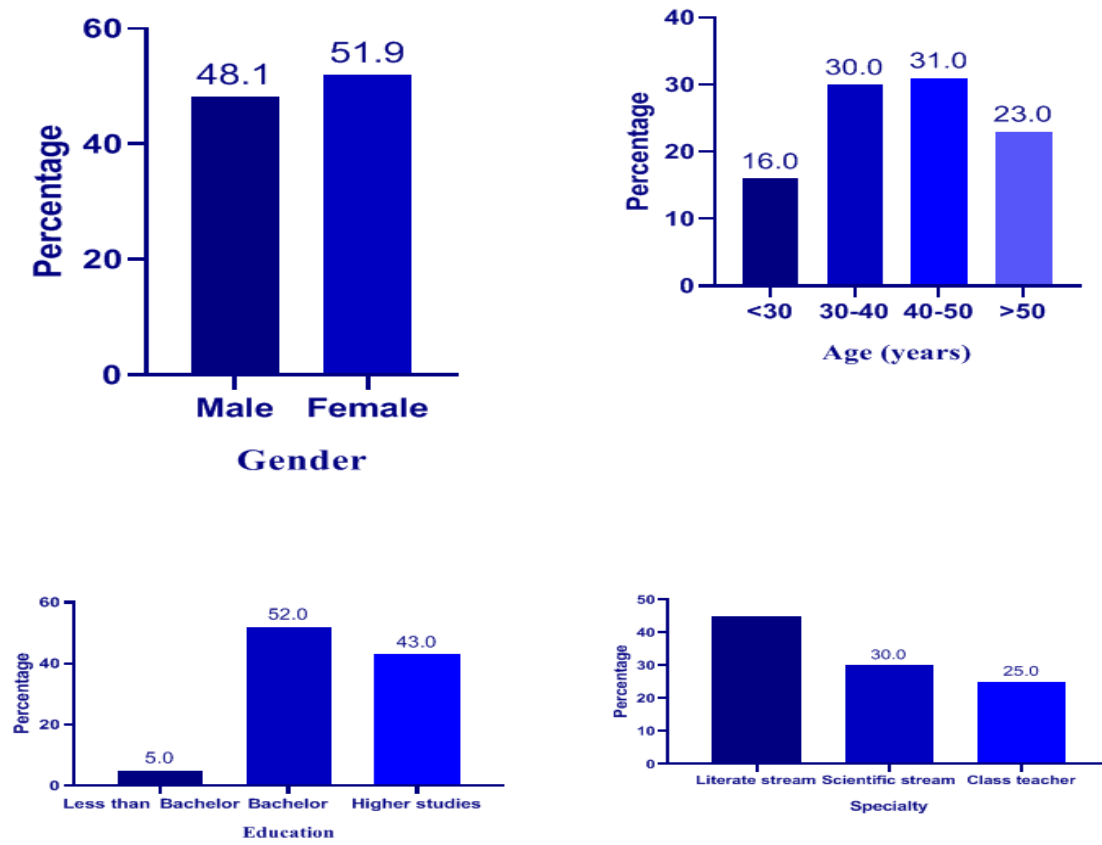


Figure 2. Demographic characteristics of principals (n=1500).

#### 4.2. Hybrid Teaching Experience and Knowledge

Table 1 shows the experience and knowledge attitudes of teachers practicing hybrid teaching. The results show that the majority of teachers did not practice hybrid teaching before the COVID-19 pandemic (97.7%) and the majority of teachers did not consider the teaching methods in hybrid teaching suitable (95.5%). A small percentage of teachers (15.2%) believed that online teaching was integrated with face-to-face teaching methods. This negative attitude reflects the preference for face-to-face teaching for most teachers in the public sector.

Table 1. The frequencies and percentages of knowledge and experiences in hybrid teaching (n=1500).

Item	Yes		No	
	Frequency	%	Frequency	%
Practice in hybrid teaching before the COVID-19 pandemic	35	2.3	1465	97.7
The measure of suitability of the teaching methodology used	23	1.5	1477	95.5
Teachers believe that online teaching integrates with face-to-face teaching	228	15.2	1272	84.8
Recipients of training before or after the pandemic in using educational tools	15	1.0	1485	99.0
Recipients of training in using teaching platforms throughout the pandemic or after the pandemic	24	1.6	1476	98.4
The school owns tools to measure the success of hybrid teaching	207	13.8	1293	86.2
Recipients of direct guidance while introducing hybrid teaching	113	7.5	1387	92.5
The education supervisors are qualified in hybrid teaching methodologies and strategies	482	32.1	1018	67.9
Recipients of help from teachers and counterparts in hybrid teaching	932	62.1	568	37.9
Ownership of suitable IT infrastructure to practice hybrid teaching from home	693	46.2	807	53.8

Almost all teachers did not receive any training in hybrid teaching before or after the pandemic in the areas of using proper educational tools or teaching platforms (99.0% and 98.4%). Also, the teachers revealed that the schools did not have the tools to measure the success of hybrid teaching (86.2%). Furthermore, most teachers did not receive direct guidance while carrying out hybrid teaching (92.5%) and the education supervisors did not have good knowledge or experience in the methodologies and strategies that can be used to improve hybrid teaching (67.9%). In practice, 62.1% of teachers shared the hybrid teaching experience. The results also show that more than 53.8% of the sample did not have good IT infrastructure to practice hybrid teaching.

#### 4.3. Teacher Trends in Hybrid Teaching

##### 4.3.1. Psychological Education Skills (PES)

Table 2 shows the teacher trends in the knowledge of psychological education skills. The knowledge of psychological education is negative (2.64±0.03). The results show that the continuity of supervisors in reporting students' psychological problems is negative in hybrid teaching (2.89±0.04). Also, the teachers do not contribute to solving students' psychological problems in online teaching (2.88±0.04). The teachers do not help parents to help their children solve their psychological problems and improve their responses to hybrid teaching (2.42±0.07). Also, the teachers do not realize that the students' problems differ between online teaching and face-to-face teaching. In addition, the teachers do not follow up on updates concerning psychological educational theories (2.24±0.08).

**Table 2.** Trends of teachers in psychological education skills.

Item	Mean	St. error
I report to my supervisors the psychological problems resulting from hybrid teaching	2.89	0.04
I am used to solving students' psychological problems online	2.88	0.04
I have previous knowledge of psychological educational theories	2.76	0.05
I help parents to help their children follow face-to-face and online lessons	2.42	0.07
I realize that the students' psychological problems are different online compared with face-to-face teaching	2.24	0.08
Total	2.64	0.03

#### 4.3.2. Teaching Styles Skills (TSS)

Table 3 shows the teacher trends in the knowledge of teaching styles in hybrid teaching. The knowledge of teaching styles is negative ( $2.64 \pm 0.04$ ). The teachers' reported that the supervisors did not evaluate the teaching styles of teachers in online teaching ( $2.77 \pm 0.05$ ). Also, the results show that the teaching styles used are similar in both face-to-face and online teaching ( $2.69 \pm 0.06$ ) as teachers realize that the styles used for online teaching should match face-to-face styles ( $2.64 \pm 0.06$ ). Also, the results are negative for the attempts made to change the teaching styles in online teaching. The teachers do not try to receive feedback from parents on the results of online and face-to-face teaching styles.

**Table 3.** Teachers' views of teaching styles and skills of hybrid teaching.

Item	Mean	St. dev
My education supervisors evaluate the teaching style I use regularly online and in face-to-face teaching	2.77	0.05
I have designed my online teaching style after the pandemic	2.69	0.06
I recognize that the teaching style in face-to-face teaching is different from online teaching	2.64	0.06
I have tried to change the style of introducing lessons in online teaching compared with face-to-face teaching	2.60	0.06
I am used to receiving feedback from parents about online and face-to-face teaching	2.50	0.07
Total	2.64	0.04

#### 4.3.3. Educational Variety Tools (EVT)

Table 4 shows the knowledge of educational tools among the teachers. The results show that the teachers do not receive any feedback from parents about the educational tools used ( $2.88 \pm 0.04$ ). Also, the tools used for online teaching are similar to those used in traditional teaching ( $2.85 \pm 0.05$ ). In online teaching, the students are not asked to present their activities to teachers and students ( $2.82 \pm 0.05$ ) reflecting that the online teaching is a way or process which only depends on teachers. The teachers are not able to integrate face-to-face teaching with online teaching ( $2.67 \pm 0.06$ ); this indicates that the teachers might introduce the same information twice. The lowest evaluation is for the attendance of supervisors and evaluation of the educational tools used ( $2.40 \pm 0.08$ ).

**Table 4.** Teachers' views on the suitability of educational tools used in hybrid teaching.

Item	Mean	St. dev
I receive feedback from students through both face-to-face and online teaching	2.88	0.04
I have changed the tools used to introduce lessons in online teaching	2.85	0.05
I encourage students to present their activities through online teaching	2.82	0.05
I can integrate the educational tools to suit face-to-face and online teaching	2.67	0.06
My supervisor attends to and evaluates the educational tools.	2.40	0.08
Total	2.72	0.03

#### 4.3.4. IT Knowledge Experience (ITKE)

Table 5 shows the teachers' tendencies and knowledge of IT preparations to practice hybrid teaching. The results show that the knowledge and experience required by teachers in IT, to execute hybrid teaching is negative ( $2.88 \pm 0.04$ ). The teachers do not have good IT knowledge to help students solve IT related problems in online lessons ( $2.88 \pm 0.04$ ). Negative assessment is also seen in the feedback from parents in using a variety of IT tools such as WhatsApp, Facebook and Instagram ( $2.88 \pm 0.04$ ). The ability to manage platforms and provide extra help to students who need help in face-to-face teaching is also negative.

**Table 5.** Teachers' views of IT knowledge experience required to practice hybrid teaching.

Item	Mean	St. dev
I have prepared myself with good IT infrastructure to execute hybrid teaching	2.88	0.04
I help the students to solve IT-related problems in online teaching	2.88	0.04
I get feedback from parents through IT applications such as WhatsApp, Instagram and Facebook	2.88	0.04
I can manage the education platforms very well	2.86	0.04
I can identify the students who face serious IT-related problems to compensate them in face-to-face education	2.83	0.05
Total	2.86	0.03

#### 4.3.5. Student Achievements Gained through Hybrid Teaching (SA)

Table 6 shows the evaluation of student achievement based on teachers' views. The results show that hybrid teaching does not improve student achievement compared with face-to-face teaching. The teachers do not measure the efficiency of online teaching through direct quizzes ( $2.86 \pm 0.04$ ). Also, the results show that teachers do not encourage hybrid teaching; also hybrid teaching neglects students with special needs and deprives them the opportunity to receive the required attention.

**Table 6.** Teachers' views of student achievement in hybrid teaching.

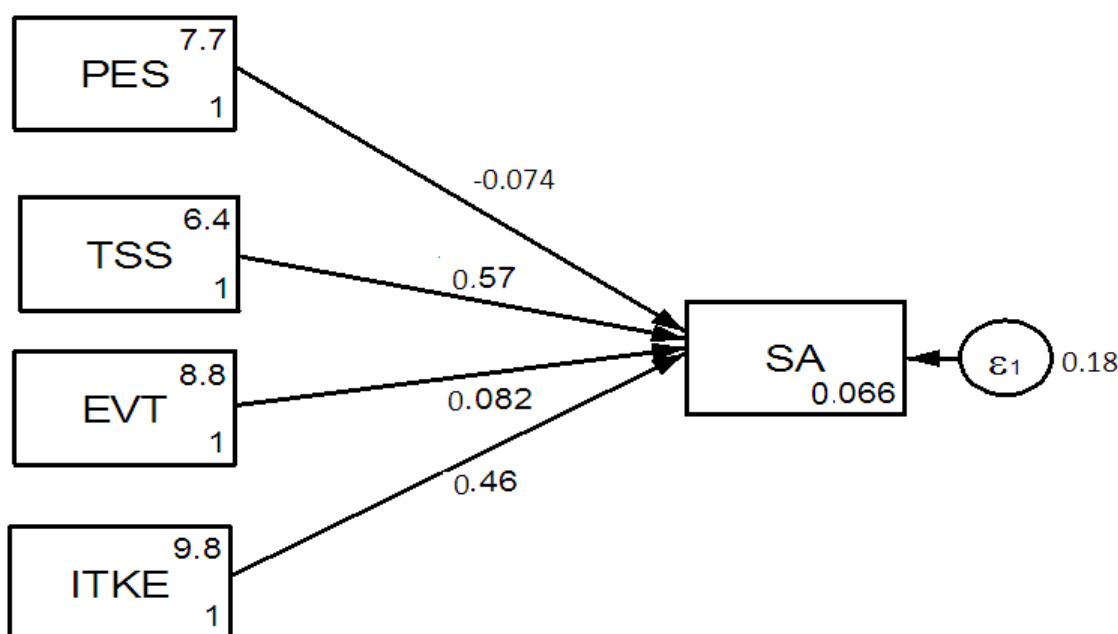
Item	Mean	St. dev
I prefer hybrid teaching as student achievement is very good compared with face-to-face teaching	2.88	0.04
Students' capabilities are measured through continuous quizzes online	2.88	0.04
The attitudes of students are measured in both online and face-to-face teaching	2.86	0.04
Parents encourage hybrid teaching to ensure the continuity of education in exceptional conditions	2.77	0.05
Hybrid teaching fails students with special needs to receive the required attention	2.60	0.06
Total	2.80	0.03

4.4. Hypothesis Testing

Table 7 and Figure 3 show the hypothesis testing using structural equation modeling through the regression coefficients, z-values, probability results and the confidence interval. The results show that the teachers' knowledge of teaching styles significantly affects the students' achievements ( $p < 0.05$ ). Also, the results show that the teachers' knowledge of IT affects the students' achievement ( $p < 0.05$ ).

**Table 7.** The effects of independent variables on student achievement.

Source of Var	Coef.	Std. er	Z	Prop	95% Conf. inter	
PES	-0.07	0.06	-1.19	0.24	-0.20	0.05
TSS	0.57	0.06	9.20	0.00	0.45	0.69
EVT	0.08	0.06	1.43	0.15	-0.03	0.19
ITKE	0.46	0.05	9.10	0.00	0.36	0.56
_cons	0.07	0.48	0.14	0.89	-0.88	1.01



**Figure 3.** The regression coefficients for the effects of PES, TSS, EVT and ITKE on SA.

5. Discussion

The objective of this study is to investigate the level of teachers' knowledge needed to meet the requirements of hybrid teaching in public schools. The study was conducted in the Eastern Area of KSA. The study sample included teachers of different age groups and experiences. The results show that in response to the COVID-19 pandemic, the teachers moved to online teaching without any preparations in educational and IT skills, or the minimum requirements to handle the educational process successfully. Pokhrel and Chhetri (2021) have shown that the move to online teaching came as a shock for both students and teachers. Subsequently, the teachers were forced to deal with a new educational method without preparing the students who were the recipients of the educational process. This empirical image gives an impression of how hybrid teaching takes shape especially in public schools. Telyani et al. (2021) state that there is a big difference between online teaching and the emergency remote teaching which was applied during the COVID-19 pandemic.

The results show that hybrid teaching was not the aim of the teaching process before the COVID-19 pandemic. Therefore, preparations to carry out this type of teaching were not done and no activities were carried out to qualify teachers to carry out this teaching process. A low percentage of teachers believe that online teaching integrates face-to-face teaching to attain the learning objectives. The low satisfaction levels frustrated the teachers and compelled them to search for different components that would succeed in this type of teaching during the pandemic and after the partial or complete opening of schools. The teachers continued to use the traditional education methods and applied traditional tools during and after the COVID-19 pandemic. The teachers started to use a new medium of teaching that they did not use before, as previously they used to interact with students face-to-face. The belief in using the online platforms and the methods of manipulating these platforms were low especially since most teachers believed that the time lost while using these platforms was high due to different IT-related problems faced by both teachers and students.

The introduction of hybrid teaching methods in normal conditions or as a response to exceptional conditions should have the strong support of governmental bodies, to prepare teachers and students, and the tools needed to execute plans. Rarely did governments evaluate the process and outcomes of hybrid teaching, and if done, the results

were not announced to the public due to their negative form. Moreover, the lack of tools to measure the efficiency of hybrid teaching lowered the interest in its application. Also, the educational supervisors who were in charge of evaluating the educational process did not have the tools to measure the efficiency of the hybrid education process. Consequently, the hybrid teaching process under all these conditions was seen as a teaching method without a clear and planned route.

The results show that teachers and education officers do not have sufficient knowledge of psychological education skills to help and encourage students to respond during online teaching in private and hybrid teaching environments in general. The teachers did not receive any capacity building in psychological education theories and their application in practical educational life. So, the teachers were not able to solve their students' psychological problems when dealing with online teaching and encourage the use of face-to-face and online teaching to produce an integrated educational process.

Throughout the hybrid teaching process, the teachers kept using the same teaching styles applied in face-to-face teaching. They did not measure the suitability of these teaching styles for online teaching or search for more effective teaching styles to activate online teaching. Teachers did not measure the efficiency of using traditional teaching styles in online teaching. The lack of feedback from students and parents encourage teachers to use the traditional teaching styles which weaken the hybrid teaching process. Doucet et al. (2020) have shown that different subjects should have different approaches to introduction. They believe that traditional teaching styles will negatively affect the search for new educational tools to introduce information to students. Teachers kept using traditional tools to introduce information to the students. Teachers did not extend much effort in searching for new educational tools to introduce the methods and concepts to students. In the absence of the evaluation of the tools used and the feedback of parents and supervisors, the teachers were encouraged to use the traditional educational tools.

Information technology related problems started with the beginning of online teaching during the COVID-19 pandemic. Most homes were not prepared with internet or equipment that facilitates joining online sessions. Even when having the infrastructure, dealing with the new platforms was a constant problem for the teachers as most of the platforms were introduced in the English language. The teachers needed training to use these platforms professionally. Also, students faced the same problem in using the equipment and platforms professionally, especially during times of pressure in internet networks.

Accordingly, the application of hybrid teaching requires the right infrastructure and tools suitable for such a teaching style. Education bodies should have clear plans to apply hybrid teaching throughout the learning years. Pokhrel and Chhetri (2021) have shown that the use of online teaching in emergency periods should be accompanied by new plans and methods for its application, side by side with teachers' capacity building, to remove the psychological shock resulting from this sudden introduction. The measurement tools should be improved to measure the success of hybrid teaching and the methods that can be applied to improve this type of teaching. Moreover, building confidence in hybrid teaching among teachers, parents and students will help with its application and improve the tendency of teachers to search for new tools and styles to introduce information and concepts to students. Petrie (2020) has shown that the best practices of hybrid teaching have not been reached. So, the introduction of such plans will help in the application and improvement of such methods.

## 6. Conclusions, Recommendations and Future Research

### 6.1. Conclusions and Recommendations

The objective of this study is to investigate the ability of teachers to carry out hybrid teaching through having the required knowledge of its application. The study was conducted on a random sample of teachers in public schools. The questionnaires were distributed online. The results showed that the preparation for hybrid teaching did not receive sufficient attention from the authorities and teachers. The results showed that despite the application of hybrid teaching even after the lockdowns ended following the near end of the COVID-19 pandemic, the application was not built on clear plans and strategies applied in formal education. Also, the results showed that the teachers' and students' tendencies towards using hybrid teaching were low. The teachers did not have the required knowledge to practice hybrid teaching. They believed that the teaching styles and tools applied in face-to-face teaching were suitable for online teaching too. The government education bodies should evaluate hybrid teaching and draw formal strategies of application that match different area conditions and different student needs. The study recommends refreshment programs for teachers on how to use hybrid teaching tools and the integration of face-to-face and online teaching methods that should be applied for capacity building among both teachers and educational supervisors.

### 6.2. Future Research

Future studies should concentrate on the readiness of educational bodies to apply hybrid teaching as a commonly applied educational process in exceptional conditions.

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