TASK DELEGATION AND COMPLETION CHECKLIST (TDCC) IN SCIENCE RESEARCH TEAM PROJECT

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Abstract:

The study determined whether Task Delegation and Completion Checklist (TDCC) promoted students' active involvement in Science Research Team Project. A mixed-method research design was utilized in this study and a total of 32 Grade 12 STEM students of Trento National High School, S.Y. 2018-2019 served as the respondents. With the use of TDCC in achieving students' main task, results revealed that there was a high level of involvement and the participation of students is complete, even beyond active participation. This implied that the checklist did not give room for free riders in a team. Hence, it allowed students to be involved through delegated subtasks and valued the sense of completion for the team. The emerged themes in Focus Group Discussion (FGD) on the topics of attributes and benefits gained with the use of TDCC were all positive and useful for the students themselves. Generally, the use of TDCC promoted students' involvement in Research Teams from whichever group, either belonged to Biology, Chemistry, or Physics. It is recommended that research advisers will consider the use of TDCC for students in research team projects, as well as to teachers handling different learning areas that maximize group works to promote student involvement in a team.

Keywords: task checklist, science research, team project, active involvement

1. Introduction

There is a great call for individuals all around the world to conduct researches. In Science, research is a diligent systematic inquiry into nature and society to validate and refine existing knowledge and to generate new knowledge (Naidoo, 2011). Institutions worldwide allow students to embrace the research world by participating in a competition like Intel International Science and Engineering Fair (Intel ISEF). Osburg and Istrate (2008) described Intel ISEF as the world's largest pre-college science fair and Intel has been the primary sponsor. Also, as news and advertisements came across, it is an annual event creating an avenue for science enthusiast learner-researchers, to showcase their output from the country they originated. The students' sacrifices in their research

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study have paid off with the rewards given. Such research outputs do not only give fame to researchers but most importantly, have also brought the significance of their research to their school, community, nation, and to the world as a whole.

In today's curriculum of the Department of Education, the immersion in research across different fields has inevitably intensified. This has been reflected in the courses/subjects that have been offered in Senior High Schools. One of the research subjects offered in the Science, Technology, Engineering, and Mathematics (STEM) strand is Research/Capstone Project. It is a specialized subject where at the end, learners should present a research project through written and oral presentation. Engaging in scientific research is truly a daunting activity. It has been described in the study of Bocar (2013) that research work, in general, is tiresome and tedious work to execute. However, this work oftentimes is an academic requirement that no teachers and students alike can escape.

Despite some negative outlook on doing research projects; still, it offers a wide benefit to students in the learning process. Fortunately, educators are continuously seeking strategies to track students which eventually may lead to promoting their involvement in tasks. According to Rowlands (2007), checklists serve as an assessment tool for teachers in which they can capture and record information from students' performances. This could help in instructing and presenting evidence-based data for their assessment.

Trento National High School is one of the public secondary schools in the Division of Agusan del Sur which offers STEM strands in Senior High School. Based on ocular observation and initial interview with teachers and students, it was found out that no research output was visible for any referral and project display for evaluations. Previous research projects were having been identified as undone or not compiled. One great factor of such deficiency is the level of involvement of each member within a research team. Another also was an issue on failing to submit work assignments among students which were mentioned in the study of Cavanaugh et al. (2012). Additionally, it has been known that the continuance of students' learning and potential success might be hindered by the loss of any project component.

Moreover, issues with regards to the learner's involvement in group work were put into consideration that needs to be addressed as the research gap. It is undeniable that monitoring and managing students' involvement in a bigger population of students like in Trento NHS may somehow be neglected and taken for granted. Numerous extracurricular activities that disrupt classes, teachers with heavy workloads, and those new on teaching careers, especially in senior high school are just a few constraints in accommodating the needs of every learner. Notably, students in the four corners of a room are diversified and the presence of students that do not get involved likely exist. According to Hall and Buzwell (2013), together along with the appraisal on the application of group work in classes, cases on unequal contribution among students within groups has been reported. Those students were referred to as 'free-riders' of a team. The presence of this behavior may bring unpleasant experiences to some students. Also, in the study of McArdle and his colleagues (2005), it was revealed that even though

cooperative learning brought numerous positive outcomes, including the apparent exchange of abilities to the working environment, a possible issue of free riding by some team members may occur, which may give a negative effect to the group. Free riding happens when there are individuals in a team who choose to cease from taking part in doing group tasks. Oftentimes, it can be a challenge with the team since it puts an additional duty upon other group members to make up for the absence of exertion among the free riders.

With such occurrence in a class that works in a team, there is a need in conducting this research. This may give an impact on Grade 12 STEM students in dealing with their group along their scientific research project course. Moreover, since Senior High School is still in the piloting stage of implementation, there is a call for research addressing the problems being encountered in the realm of education.

2. Statement of the Problem

This study generally determined whether Task Delegation and Completion Checklist (TDCC) promoted students' active involvement in a Science Research Project Course. Specifically, it sought to answer the following questions:

1) What is the level of student involvement in a Science Research Team Project with the use of task delegation and completion checklist?
2) Is there a significant difference in the student's involvement when grouped according to the characteristics of TDCC in the Research Project course?
3) What is the perception of the students in using task delegation and completion checklist in the Science Research Team Project?

3. Methods

A mixed-method research design was used in this study, applying both quantitative and qualitative approaches. The respondents of this study were the Grade 12 STEM students of Trento National High School with a total of 32 individuals who were enrolled in the Research Project course, the second semester of S.Y. 2018-2019. The subject had been purposefully categorized into three, namely: Biology (12 students), Physics (12 students), and Chemistry (8 students). Basically, one subject is to one teacher only. However, it was handled by three different teachers to properly address the guidance of the students in their chosen field of interest. The teams consisted of three members except for only one team which had only two students. The respondents were selected accordingly for the attainment of the objectives of this research and as to the reason that Research/Capstone Project can also only be taken by STEM students during their 12th grade as stipulated in the curriculum guide. This made the study follow complete selection also known as criterion sampling of purposive sampling technique. All members of a population of interest were selected to meet a special criterion (Teddlie and Yu, 2007).

Upon the conduct of the study, a request letter asking for permission was handed to the School Principal of Trento National High School. All research instruments were

consulted, assisted and validated by education experts through a Content Validation Instrument. It underwent collaboration through checking and revision of the instruments until it met the standard criteria. These instruments were the Task Delegation and Completion Checklist (TDCC) which was used as a tool that aims in helping the students to get involved in a task given by a research adviser. Another was the evaluation tool for TDCC which was also utilized to ensure students are promoted to get involved in the tasks through the checklist. In addition, the research advisers in science groups were tapped for the implementation of the study. As soon they agreed, the orientation was carried out to explain the purpose of the study and how shall the instruments be applied. Eventually, TDCC was been given to the students. Research advisers then discussed to their advisees the use of the checklist and gave the main task along with the corresponding deadline. Students in each research team headed by a leader identified their subtasks, the assignee and the deadline. As soon as the main task was met, the checklists were retrieved and the TDCC evaluation tool was given to assess students' involvement in a team. Subsequently, three different focus group discussions were conducted separately to gather students' perceptions towards the use of TDCC. The discussions followed with the guide questions. FGDs were held in a secured area and an indication was posted to be silent for awareness of anyone who passed by. The discussions were also recorded for transcription. With the necessary quantitative and qualitative data collected, data analyses were followed.

Univariate Analysis of Variance was utilized quantitatively to analyze the gathered data determining the significant difference and whether the null hypothesis be accepted or rejected. According to Moreno et al. (2014), the univariate approach is the best and easiest tool to analyze and interpreted and most appropriate also to use in small sample sizes. Table 1 pertains to the degree of involvement adapted and modified from Spradley (1980) which was used to determine the level of student's involvement in a task. On the other hand, the thematic approach was used to analyze the responses of the student-researchers during Focus Group Discussion (FGD).

Table 1: Level of Students' Involvement in Tasks

Score	Degree	Type of Participation
3.26 - 4.00	High	Complete
2.51 – 3.25	Medium-high	Active
1.76 – 2.50	Medium-low	Moderate
1.00 – 1.75	Low	Passive

4. Results and Discussion

This section congruently answers the research questions presented in the statement of the problem. The data both in quantitative and qualitative results were discussed systematically.

4.1 Students' Involvement in Research Team Project

With the use of TDCC Evaluation Tool, the students' involvement was assessed and calculated. Table 2 shows the level of involvement among students. These results were then compared and interpreted to the degree of involvement adapted and revised from Spradley (1980).

Table 2: Level of Involvement among Science Research Project Team

Science Group	Mean Score	Degree of Involvement	Type of Participation
Biology	3.25	Medium-high	Active
Chemistry	3.4	High	Complete
Physics	3.23	Medium-high	Active
Total	3.29	High	Complete

It showed that the Biology group had a mean score of 3.25 with a medium-high degree of involvement and an active type of participation of group members. The chemistry group got the highest mean score of 3.4 exhibiting a high degree of involvement and complete participation of group members. On the other hand, the physics group had only 3.23 mean score with medium-high involvement of group members and, same with the biology group, their group participation was active. In general, the level of involvement was high and all student participation was complete with a mean score of 3.29 in the research team project course.

Rowlands (2007) emphasized that operational checklists help students remember the different steps they need to take as they work through a new process, after several experiences with the same process students typically begin to internalize the steps and become capable and involved in completing the required task independently with the use of the checklist. In addition, results from the study of Wash (2014) exposed that, students' involvement was promoted through the use of a goal-oriented checklist where they autonomously identified their function and communication skill goals.

4.2 Univariate Analysis of Variance Result

Univariate Analysis of Variance is a test of significance applied in this study where there was only one dependent variable which was the student's involvement and several independent variables, which were the characteristics of the TDCC. Statistically, based on Table 3 there is no significant difference in the student's involvement when grouped according to the characteristics of TDCC. Therefore, the null hypothesis is accepted. However, this does not equally imply that TDCC is not an effective tool to promote students' involvement in Research Team Project.

Table 3: Significant Difference of Variables Using Univariate ANOVA

Source	SS	df	Mean Square	F	Sig.	Remarks
Field of Interest	.026	2	.013	.212	.812	Not Significant
Role	.024	1	.024	.402	.537	Not Significant
Total Subtasks in a Group	.037	1	.037	.612	.448	Not Significant
No. of Delegated Subtasks	.015	1	.015	.254	.622	Not Significant
Percent of Delegated Subtasks	.031	1	.031	.521	.483	Not Significant
Failed Subtask	.058	1	.058	.955	.346	Not Significant
Added Subtask	.061	1	.061	1.013	.333	Not Significant
Percent of Completed Assigned Subtask	.236	1	.236	3.903	.070	Not Significant

a. Field of Interest in Science

The science group where a student belonged does not determine the involvement performed in a task. This has made the field of interest and student involvement are not significant. To put it another way, the students are still involved regardless of whether they were in Biology, Chemistry, or Physics.

b. Role in a Team

There is no significant difference in student involvement and their role in a team because they equally contributed to the tasks. The position of a student, it may be a leader or just a member does not show any difference in the involvement. This implies that with the use of TDCC, subtasks were delegated well, and it opens the opportunity for a student to get involved.

c. Total Subtasks in a Group

Regardless of the total number of subtasks created in a group, whether it ranged from 5 to 7 or from 8 to 10, students showed participation among the group.

d. Number of Delegated Subtasks

Students whose delegated subtasks were less than four and those with four and above showed no significant difference for they achieved the tasks evenly.

e. Percentage of Delegated Subtasks

Those students who had 50% and less of the percentage of the delegated subtasks and those with more than 50% were able to cater the subtasks, had participated and done their duties to meet the main task.

f. Failed Outcome

The criteria for being failed in the delegated subtask did not mean that the student failed to do the task. However, it has been noted only that the student did not meet the expectation. For instance, the student was not yet done, found difficulty on the assigned task, or had been helped by the group mates. Also, the student's involvement is not significant whether there is or none and there is the failed outcome. Hence, the number of failed outcomes does not give weight to say that it has a significant difference.

g. Added Subtasks

Opposite to the failed outcome, added subtasks were given to students who did not supposedly do their assigned task. These added subtasks were not actually part of their task, but to complement the failed outcome of other members of the group, they had contributed or volunteered themselves to other tasks. Overall, the distribution was minimal and was not enough to say that there is a significant difference. This means that there were just a few failed outcomes and added subtasks because they did their part and tried to do their best to involve in their team.

e. Percentage of Completed Subtasks

Lastly, the percentage of completed assigned subtasks, below 100% and 100% and above, does not make a difference as to the involvement of the students.

The result has been supported by other studies conducted. A study conducted by Hassel and Ridout (2018) yielded no significant difference of group differences on the student engagement in which assessment of differences in endorsement of positive and/or negative expectations when compared to responses of lecturers who taught the first year versus second year and above. Blumenfeld and Meece (1988) presented findings that indicated that student involvement did not differ significantly by the difficulty of cognitive content, type of social organization, or procedural complexity of tasks. Analysis of variance procedures was used to test the effects of task dimensions on students' reported involvement and cognitive engagement. Involvement did not differ by the difficulty of cognitive content, type of structure, or degree of procedural complexity. They also pinpointed that based on several studies, it showed that students react more positively to classes where small groups or manipulative materials are used. They expected that involvement would be higher when these were present. One explanation for the discrepancy between their results and other studies is that the teachers they observed regularly used a variety of structures and materials so that students' involvement in these classes already was relatively high.

Results revealed as presented in this study that the use of TDCC, closes the gap of being diversified and heterogeneous. It created an avenue or room for students to be homogenous, promoting everyone to be involved in the tasks, since they were delegated and guided to meet the main task.

4.3 Perception of Students on the Use of TDCC

The individual responses during focus group discussions among students on their perception of the use of TDCC were analyzed. Three highlighted topics as the center of the discussion were tackled: (1) attributes developed with the use of TDCC, (2) benefits gained using TDCC, and (3) impediments encountered along with the application of TDCC.

Table 4 displays the results in the qualitative thematic analysis which formed themes out of subthemes. The attributes developed by the students with the use of TDCC were in five themes. These are: time-oriented, managerial, submissive, systematic, and cooperative. In addition, four themes emerged in the benefits gained using TDCC, such

as: goal-oriented, timeliness, directed, and reference as to the achievement of their tasks. Moreover, time constraints and limited resources were the themes that occurred in the impediments encountered by the students during the implementation of TDCC.

Table 4: Emergence of Themes and Subthemes
Based on Analysis of Focus Group Discussion (FGD)

Topic	Theme
Attributes Developed	Time-oriented
	Managerial
	Submissive
	Systematic
	Collaborative
Benefits Gained	Goal-oriented
	Timeliness
	Directed
	Reference
Impediments Encountered	Time constraints
	Limited Resources

The emergence of the themes in the attributes developed was noticeably good feedback for Task Delegation and Completion Checklist. Tarricone and Luca (2002) mentioned that members working in a team, in a cooperative atmosphere to reach unified team goals, by exchanging their information and talents are what collaboration is all about. Their study investigated the attributes possessed by successful teamwork. Results indicated that the team exhibited the qualities required for effective teamwork. It was clear from almost all of the responses they received in various methods that successful teams were dedicated to the following: dedication to team accomplishment and common objectives, interconnectedness, social skills, open dialogue and good comments, suitable team structure.

A. Time-oriented
This theme emerged from managing time, sense of urgency, and prioritization subthemes. Sample statements are as follows:

> *"For me, time management is one attitude that I developed. My teammates may have gained it too. I reminded them that if the scheduled deadline is unmet, failure to submit shall be recorded on the feedback/note section. With this, they tried hard to achieve the task and I hope that they will continue the said attribute."* (B-T-1)

> *"I noticed in myself that once a certain task is given, I would only attend to that task once the deadline gets close. This time, I don't have to be in a hurry because if I may have some tasks to execute, I'd do it ahead of time, instead of cramming. I think it's so-called time management and prioritization. Before, I took for granted the task deadlines and this may*

have caused me to cram on my tasks. This time, for as long as I could on task, I'd do it earlier. I valued the sense of urgency." (P-T-1)

Peng and Kamil (2017) indicated that time management is the skill in which all students should not only know but also need to know how to apply. Students have a lot of tasks and must satisfy a lot of different lecturers, and the grades for each subject are determined by the academic task quality.

B. Managerial

Participants expressed that they developed a sense of responsibility and acquired leadership attitudes. Example statements were:

"As a leader, my own leadership traits were also developed. Through the delegation of tasks to other members, it would not become burdensome on my part." (B-T-1)

"I became responsible." (B-T-3)

"Being responsible in tasks." (P-T-3)

Ellis (2015) stressed that team leaders must learn to delegate. As a given statement, letting go of some tasks and passing these to other members of the team is one of the first skills that any team leader must learn of. Also, it was highlighted that delegation is not about shifting responsibility. Hence, it is about identifying tasks that the leader does not need to do and identifying someone who can do them and who will benefit from engaging in the challenge that undertaking new tasks brings.

C. Submissive

Responsiveness to the leader and obedience were noted from the responses of the participants. These sub-themes were notable from the participants. For instance:

"The leader is the one who commands and we should be responsive as members of the group. We need to follow her instructions and the timeliness of accomplishing the tasks given." (B-T-3)

"Obedient. To obey our leader. Whatever tasks given to us, we should accomplish it." (B-T-2)

Lakhani et al. (2012) asserted that supportive team members increase group efficacy by sharing more information, solving more problems and increasing collaborative assistance.

D. Systematic

Participants were informed to be organized and to follow sequential tasks using of TDCC. The sample statement was:

> *"Being organized, knew how to manage time and follow tasks flow in research."* (C-T-1) and was agreed by C-T-2

E. Collaboration

Using TDCC, subthemes such as to collaborate and to actively participate were formulated out of the students' responses. Some were:

> *"The need to collaborate among the three of us, to keep our ideas intact or our study."* (P-T-2)

> *"Being participative in all tasks and group works."* (P-T-3)

A study conducted by Bocar (2013) revealed that a great extent of difficulty for the students in conducting their research study is to get hold of the cooperation of their respondents. This is contrary to the researcher's findings where students were induced to play an active part in the research process using TDCC.

The benefits gained from the use of TDCC brought students to four themes. These were goal-oriented, timeliness, directed, and reference.

F. Goal-oriented

The following sub-themes were specified: tasks easily done, focused on one's task, helpful in completing tasks, able to organize tasks, does outline to achieve the main tasks and brainstorming. Excerpts from the participants' answers are as follows:

> *"It is helpful because tasks were easily done. Main tasks were accomplished and submitted on time because sub-tasks were divided among us. If it is agreed upon that today is the deadline, it should be submitted today."* (B-T-2)

> *"We should be focused. Whatever task given on to you, you should focus on it. Everyone has their own roles and thus you'd get to focus on your own time in rendering tasks that are expected from you. I become more responsible for my own task because we have to observe timeliness."*

> *"It was helpful to complete our tasks."* (C-T-3)

> *"We had an outline to achieve our main task."* (P-T-2)

The research on goal orientation is uncovering a lot of very interesting differences in the way a student acts depending on the goal orientation operating at the moment.

Goals influence what a student chooses to study, how strategic they are in their study patterns, how persistent they are in the face of difficulties, and whether they are willing and able to go beyond the course requirements (Svinicki, 2005). Dweck and Leggett (1988) identified the general theory called achievement goal orientation, which refers to the fact that the type of goal toward which a person is working has a tremendous impact on how they pursue the goal.

G. Timeliness

The use of the TDCC made the students develop a sense of timeliness. Its emergence was supported by the following sub-themes: time consciousness, guided time frame, reminders of the tasks, and indicated deadline. Example statements were:

> *"We were conscious of our time. It is shameful if the task was delegated on you and you cannot submit."* (B-T-2)

> *"We had been reminded of our tasks that were needed to do."* (C-T-2)

> *"One more thing is the deadline, if you were assigned to this, you could perceive the deadline. You get to do the thing in advance or organize your time. For example, you get to cancel some other personal activities because of the perceived deadline."* (P-T-1)

Responses of the students were supported on the study of Cavanaugh et al. (2012) that there was a better performance among the learners in the timeliness of homework submission, thereby resulting also to increase in the course satisfaction for both teachers and learners. Moreover, Adebayo (2015) emphasized that students need to regulate or reduce the amount of time spent on activities such as attending dinners and parties, chatting, phoning and pinging as these have a serious negative impact on their academic performance. The more time students spend on social activities the more their educational activities are affected. Thus, it affects the fulfillment and achievement of the educational goals of the students.

H. Directed

The use of TDCC led the students to be more directed with the tasks at hand. Sub-themes that contributed to this were: Informed, oriented, guided with tasks. Examples are:

> *"For me, TDCC will guide us upon the completion of the tasks. This will guide us to maximize our time for our research. And so, it is really helpful."* (B-T-1)

> *"We were informed."* (C-T-2)

I. Reference

Participants emphasized that with the use of TDCC they had basis and reference. Sample statements were:

"We had our basis." (C-T-2)

"It served as a reference for us to organize our ideas." (P-T-3)

Two main impediments were encountered upon the application of the TDCC tool. These were time constraints and limited resources.

J. Time constraints

Time, the uncertainty of setting the time, deadline, meeting the tasks on time, distributing tasks, application of TDCC, scheduling of subtasks, the adviser was busy. Examples were:

"The time on setting the deadline for each subtask, because some detailed subtasks were really uncertain." (B-T-2)

"TDCC should have been given before the project started." (B-T-1)
"Maybe because TDCC was given late. It should have been given before the project started." (B-T-1)

As emphasized by Bocar (2013), student researchers found it challenging to finish and submit their required research output on time. This was one of the difficulties encountered by student researchers.

K. Limited Resources

The second impediment was attributed to the following sub-themes: volume of school work/readings, unable to access materials, insufficiency of resources in the library, poor internet signal and financial matters. Statements are as follows:

"At Senior High School, we had lots of schoolwork to do and readings to finish. I consider it as a hindrance. Though we are about to gradually finish these school works but the weight in our backs continues as other subjects are also requiring us to submit and carry out some other tasks. (P-T-1)

"Also, research requires internet use. We have a weak internet signal at home." (P-T-2)

"Meeting tasks especially when it requires financial aspect." (C-T-3)

According to Hongisto & Sormunen (2010), information seeking and use of sources, work process, end-product and technical problems were some of the complex learning tasks and problems faced by students. In addition to this, Bocar (2013) discussed personal problems like time and stress management, which may disturb a student's concentration.

5. Conclusion

Based on the findings presented in this study, it is drawn to the conclusion that when grouped according to the characteristics of TDCC, the students' involvement was insignificant. This implies that the use of TDCC promotes students' involvement where each member of the team had their own subtask and responsibility to take. Task Delegation and Completion Checklist close the opportunity of the students of being free riders of the team.

6. Recommendations

Based on the conclusion, the following recommendations were suggested:

1. Research advisers may consider using Task Delegation and Completion Checklist to students in research team project class, as well as to teachers in different learning areas handling students in group work to promote student's involvement in a team.
2. Trento National High School and other secondary schools offering senior high school may create a research department to plan and unify guidelines for any research subjects. It may also include approaches and strategies such as the use of TDCC to make the student's journey in research lighter.
3. Another study similar to this research may be conducted applying different methods. The use of the Gantt chart may consider tracking students on the tasks given with indicated timeline. It may be conducted with greater respondents and analyzing data using other statistical tools.

Conflict of Interest Statement
The author declares no conflicts of interest.

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References

Adebayo, F. A. (2015). Time management and students' academic performance in higher institutions, Nigeria a case study of Ekiti state. *International Research in Education*, *3*(2), 1-12. Retrieved 10 May 2019 from

https://pdfs.semanticscholar.org/4d73/385792ee79b
0f19c3e7f8a2983f8a50296d4.pdf

Aparecio, M. B. M. (2018). Mentoring, self-efficacy and performance in conducting investigatory projects: a mixed-method analysis. *Asia Pacific Institute of Advanced Research (APIAR), 4*(2), 65-76. DOI: 10.25275/apjcectv4i2edu7. Retrieved 28 May 2019 from https://apiar.org.au/wp-content/uploads/2018/07/7_APJCECT_2018_Edu_v4i2_65-76.pdf

Blumenfeld, P. C., & Meece, J. L. (1988). Task factors, teacher behavior, and students' involvement and use of learning strategies in science. *The Elementary School Journal*, *88*(3), 235-250.

Bocar, A. C. (2013). Difficulties Encountered by the Student – Researchers and the Effects on Their Research Output. *SSRN Electronic Journal*. doi: 10.2139/ssrn.1612050. Retrieved from 8 October 2018 from https://www.researchgate.net/publication/255967042_Difficulties_Encountered_by_the_Student_-_Researchers_and_the_Effects_on_Their_Research_Output

Castelfranchi, C., & Falcone, R. (1998). Towards a theory of delegation for agent-based systems. *Robotics and Autonomous Systems*, *24*(3-4), 141-157.

Cavanaugh, T., Lamkin, M. L., & Hu, H. (2012). Using a Generalized Checklist to Improve Student Assignment Submission Times in an Online Course. *Journal of Asynchronous Learning Networks, 16*(3), 39-44. Retrieved 23 November 2018 from https://files.eric.ed.gov/fulltext/EJ982680.pdf

Chiriac, E. H. (2014). Group as an incentive for learning – students' experiences of group work. *Frontiers in Psychology, 5*(558), 1-10. doi: 10.3389/fpsyg.2014.00558. Retrieved 20 November 2018 from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4046684/pdf/fpsyg-05-00558.pdf

Clay-Williams, R., & Colligan, L. (2015). Back to basics: checklists in aviation and healthcare. *BMJ Qual Saf*, *24*(7), 428-431. Retrieved 11 May 2019 from https://qualitysafety.bmj.com/content/qhc/24/7/428.full.pdf

Cuartero, O. L. (2016). Impact of Doing Science Investigatory Project (SIP) on the Interest and Process Skills of Elementary Students. *International Journal of Multidisciplinary Academic Research, 4*(5), 27-41.

Dorling, H., White, D., Turner, S., Campbell, K., & Lamont, T. (2014). Developing a checklist for a research proposal to help describe health service interventions in UK research programmes: a mixed-methods study. *Health Research Policy and Systems, 12*(12), 2-8. Retrieved 23 November 2018 from http://www.health-policy-systems.com/content/12/1/12

Dweck, C., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. Psychological Review, 95, 256–273. Retrieved 28 May 2019 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.583.9142&rep=rep1&type=pdf

Ekblaw, R. (2016). Effective Use of Group Projects in Online Learning. C*ontemporary Issues in Education Research*, *9*(3), 121-128. Retrieved 11 May 2019 from https://files.eric.ed.gov/fulltext/EJ1106897.pdf

Ellis, P. (2015). Leadership and management: delegating for success. *Wounds UK, 11*(2). 70-71. Retrieved 10 May 2019 from https://www.wounds-uk.com/download/resource/851

Ellis, N., & Loughland, T. (2016). The challenges of practitioner research: A comparative study of Singapore and NSW. *Australian Journal of Teacher Education*, *41*(2), 8. Retrieved 8 May 2019 from https://files.eric.ed.gov/fulltext/EJ1091767.pdf

El-Abd, M. (2017). Preparation of Engineering Students for Capstone Design Experience through a Microprocessors Course. *iJEP*, *7*(4), 91-101. Retrieved 12 October 2018 from https://doi.org/10.3991/ijep.v7i4.6787

Frels, R. K., Sharma, B., Onwuegbuzie, A. J., Leech, N. L., & Stark, M. D. (2011). The Use of a Checklist and Qualitative Notebooks for an Interactive Process of Teaching and Learning Qualitative Research. *Journal of Effective Teaching*, *11*(1), 62-79. Retrieved 26 April 2019 from https://files.eric.ed.gov/fulltext/EJ1092167.pdf

Frykedal, K. F., & Chiriac, E. H. (2018). Student collaboration in group work – Inclusion as participation. *International journal of disability, development and education*, *65*(2), 183-198. Retrieved 8 May 2019 from http://www.diva-portal.org/smash/get/diva2:1139426/FULLTEXT01.pdf

Grima-Farrell, C. (2017). What matters in a research to practice cycle? Teachers as researchers. *Springer Singapore*. DOI: https://doi.org/10.1007/978-98 1-10-2087-2

Gomez, R. G. (2013). A Project-Based Approach to Enhance Skills in Science Investigatory Projects among Secondary School Students in Northern Mindanao. In *The Mindanao Forum* (Vol. 26, No. 1, pp. 1-1). Retrieved 28 May 2019 from https://ejournals.ph/article.php?id=7123

Hargreaves, A. (2001). *Changing teachers, changing times: Teachers' work and culture in the postmodern age*. A&C Black.

Hall, D., & Buzwell, S. (2013). The problem of free-riding in group projects: Looking beyond social loafing as a reason for non-contribution. *Active Learning in Higher Education, 14*(1), 37–49. Retrieved 9 May 2019 from https://doi.org/10.1177/1469787412467123

Hart, S. R., Stewart, K. & Jimerson, S. R. (2011). The Student Engagement in Schools Questionnaire (SESQ) and the Teacher Engagement Report Form-New (TERF-N): Examining the Preliminary Evidence. *Contemporary School Psychology, 15*, 67-79. Retrieved 26 November 2018 from https://files.eric.ed.gov/fulltext/EJ934707.pdf

Hassanien, A. (2006). Student experience of group work and group assessment in higher education. *Journal of teaching in travel & tourism*, *6*(1), 17-39. Retrieved 19 November 2018 from https://www.tandfonline.com/doi/pdf/10.1300/J172v06n01_02?needAccess=true

Hassel, S., & Ridout, N. (2018). An Investigation of First-Year Students' and Lecturers' Expectations of University Education. *Frontiers in psychology*, *8*, 2218. Retrieved 9 May 2019 from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5790796/pdf/fpsyg-08-02218.pdf

Hongisto, H., & Sormunen, E. (2010). The challenges of the first research paper: Observing students and the teacher in the secondary school classroom. *Practising*

information literacy: bringing theories of learning, practice and information literacy together, 95. Retrieved 10 May 2019 from https://blogs.sis.uta.fi/know-id/files/2010/05/Hongisto_Sormunen_v10_co py.pdf

Lakhani, J., Benzies, K., & Hayden, K. A. (2012). Attributes of interdisciplinary research teams: a comprehensive review of the literature. *Clinical & Investigative Medicine*, *35*(5), 260-265. Retrieved 10 May 2019 from https://pdfs.semanticscholar.org/132a/5abf17f2230 cea68f677b8e24e2cfe733b51.pdf

Leerkes, E. M., & Howell, D. C. (n.d.) SPSS Manual to Accompany Howell's Fundamental Statistics for The Behavioral Sciences (7th Edition). *Comparing Means Using One Way ANOVA.* Retrieved 27 May 2019 from https://www.uvm.edu/~dhowell/fundamentals7/SPSSManual/SPSSLongerManu al/SPSS Chapter8.pdf

Lin, L. (2015). Investigating Chinese HE EFL Classrooms. *Springer-Verlag Berlin Heidelberg.* doi: 10.1007/978-3-662-44503-7_2. Retrieved 30 November 2018 from https://pdfs.semanticscholar.org/58c6/798b9afabb6bb1e7df1259123e94425e4d05.p df

McArdle, G., Clements, K. D., & Hutchinson-Lendi, K. (2005). The Free Rider and Cooperative Learning Groups: Perspective from Faculty Members. *Education Resources Information Center, 23*(1), 529-535. Retrieved 9 May 2019 from https://files.eric.ed.gov/fulltext/ED492459.pdf

McKim, C. A. (2017). The value of mixed methods research: A mixed methods study. *Journal of Mixed Methods Research*, *11*(2), 202-222. Retrieved 26 May 2019 from http://didier-jourdan.com/wp-content/uploads/2017/04/MM-and-Graduates-students.pdf

Miekley, J. (2005). ESL textbook evaluation checklist. *The Reading Matrix*, *5*(2). Retrieved 23 November 2018 from http://www.readingmatrix.com/reading_projects/miekley /project.pdf

Moreno, C., Mancebo, I., Tarquis, A. M., & Moreno, M. M. (2014). Univariate and multivariate analysis on processing tomato quality under different mulches. *Scientia Agricola*, *71*(2), 114-119. Retrieved 27 May 2019 from http://www.scielo.br/pdf/sa/v71n2/a04v71n2.pdf

Naidoo, N. (2011). What is research? A conceptual understanding. *African Journal of Emergency Medicine. 1*, 47-48. Retrieved from 23 May 2019 https://www.researchgate.net/publication/265704878_What_is_research_A_conce ptual_understanding

Peng, T. Z., & Kamil, B. A. M. (2017). Time Management, Procrastination and Prioritization: A Framework for Service Based Learning Module. *e-Academia Journal, 6*(2), 60-70. Retrieved 10 May 2019 from https://journale-academiauitmt.uitm.edu.my/v2/images/vol6issue2/PID114_TIMEMANAGEME NTPROCRASTINATION.pdf

Osburg, T., & Istrate, O. (2008). Intel Education initiative. Focus: Roamania. In *Proceedings of the 3rd International Conference on Virtual Learning*, 403-408. Retrieved 23 May

2019   from
http://www.cniv.ro/2008/disc/icvl/documente/pdf/intel/ICVL_intelEducation_pa
per 01.pdf

Roberts, S. M., & Pruitt, E. Z. (Eds.). (2008). *Schools as professional learning communities: Collaborative activities and strategies for professional development*. Corwin Press.

Rowlands, K. D. (2007). Check It Out! Using Checklists to Support Student Learning. *English Journal, 96*(6), 61-66.

Rudawska, A. (2017). Students' Team Project Experiences and Their Attitudes Towards Teamwork. *Journal of Management and Business Administration 25*(1), 78-97. doi: 10.7206/jmba.ce.2450-7814.190. Retrieved 20 November 2018 from https://content.sciendo.com/view/journals/jmbace /25/1/article-p78.xml

Rust, F. (2009). Teacher research and the problem of practice. *Teachers college record, 111*(8), 1882-1893. Retrieved 9 May 2018 http://www.francesrust.com/Site/Publications _files/38_15506.pdf

Schoonenboom, J., & Johnson, R. B. (2017). How to construct a mixed methods research design. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie, 69*(2), 107-131. Retrieved 26 May 2019 from https://link.springer.com/content/pdf/10.1007%2Fs11577-017-0454-1.pdf

Schunk, D. H. (2012). Learning Theories, an Educational Perspective (6th ed.). Boston, MA: Pearson Education Inc. Retrieved 8 May 2019 from http://repository.umpwr.ac.id:8080/bitstream/handle/123456789/96/%5BDale_H._ Schunk%5D_Learning_Theories_An_Educational..pdf?sequence=1&isAllowed=y

Shakenova, L. (2017). The Theoretical Framework of Teacher Collaboration. *Khazar Journal of Humanities and Social Science, 20*(2), 34-48. Retrieved 10 May 2019 from http://jhss-khazar.org/wp-content/uploads/2016/11 /2.Lyaila.20.02.2017.2.pdf

Shehadeh, A., & Coombe, C. A. (Eds.). (2012). *Task-based language teaching in foreign language contexts: Research and implementation* (Vol. 4). John Benjamins Publishing. Retrieved 1 December 2018 from https://www.scribd.com/doc/234627405/Ali-Shehadeh-Christine-a-Coombe-Task-Based-Language-Teaching-in-Foreign-Language-Contexts-Research-and-Implementation.

Spradley J. P. (1980). *Participant observation*. Fort Worth: Harcourt Brace College Publishers.

Svinicki, M. (2005). Student goal orientation, motivation and learning. *Idea Paper*, 41. Retrieved 28 May 2019 from https://www.doe.in.gov/sites/default/files/cte/ncteb-studmotiv.pdf

Tarricone, P. & Luca, J. (2002). Successful teamwork: A case study. *Higher Education Research and Development Society of Australasia, Inc*. 640-646. Retrieved 10 May 2019 from http://www.unice.fr/crookall-cours/teams/docs/team%20Successful%20teamwork.pdf

Teddlie, C. and Yu, F. (2007). Mixed Methods Sampling: A Typology with Examples. *Journal of Mixed Methods Research, 1*(1), 77-100. doi: 10.1177/2345678906292430. Retrieved   19   November   2018   from

http://www.samuellearning.org/Research_Methods/Mixed_Methods_Sampling_
Teddlie_and_Yu_2007.pdf

Ulla, M. B. (2018). Benefits and challenges of doing research: Experiences from Philippine public-school teachers. *Issues in Educational Research*, *28*(3), 797-810. Retrieved 8 May 2019 from http://www.iier.org.au/iier28/ulla.pdf

Wash, I. (2014). Goal-Oriented Self-Checklists: Principles, Practice & Evaluation. *New Directions in Teaching and Learning English Discussion*. 250-257. Retrieved 10 May 2019 from https://rikkyo.repo.nii.ac.jp/?action=pages_view_main&active_action=repository_view_main_item_detail&item_id=16149&item_no=1&page_id=13&block_id=49