Systematic Curriculum and Instructional Development for a Mixed Methods Research: SCID-MMR

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Abstract. The aim of this study is to present a learning package which provides the necessary knowledge and attitudinal information, and practice opportunities based on SCID (Systematic Curriculum and Instructional Development) for the task of developing a Mixed Methods Research (MMR) correctly. SCID-MMR (Systematic Curriculum and Instructional Development for Mixed methods Research) is a learning package for guidance of a mixed methods research. This learning package is organized based on three enabling objectives: practice writing methodology of MMR data, practice analyzing MM data and practice discussing and concluding results of MMR data. To achieve those three enabling objectives, a learner should follow the steps of learning activities consisting of information sheet with samples of author's and others' quantitative, qualitative and MMR articles published in various journals, self-check model questions and answers, and practice exercises in addition to final performance test and standards.

Keywords: Systematic curriculum and instructional development, mixed methods research

1. Introduction

Developing a MMR manuscript is a part of building a component academic staff in social sciences. This SCID-MMR guide will provide you the general knowledge and skills needed for developing a MMR manuscript for your academic position. As part of the academic staff, it is important to understand and to complete a project with a genuine research at an advanced level both individually and as a member of a research team. Generating new knowledge in the field of MMR will aid your growth and competence among academic staff for prospective promotion in your career. This guide will help you become successful in those efforts.

1.1. Performance objective

Given qualitative and quantiatative data, write a MMR manuscript. The finished job must meet all criteria on Performance Test on 5 and 5.1.

1.2. Enabling objectives

1. Practice writing methodology of MMR data.
2. Practice analyzing MMR data.
3. Practice discussing and concluding results of MMR data.

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1.3. Prerequisites

- Master / PhD degree in the related field;
- Knowledge of using Information and Communication Technology (ICT) (MS(Microsoft), word, excel etc.), using Data Analysis Softwares (quantitative and qualitative NVIVO, SPSS etc), analytical thinking, critical thinking;
- Knowledge of philosophy of social sciences.

2. Writing Methodology of MMR Data

As seen in Table 1: Learning experience #1, you should follow the steps of learning activities by taking care of special instructions in practice writing methodology of MMR data.

Table 1.

Learning experience #1

Enabling Objective #1: Practice writing methodology of MMR data	
Learning Activities	**Special Instructions**
Read the Information Sheet titled 'Practice writing methodology of MMR data' on 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11	
Watch the qualitative data analysis video, read quantitative data analysis tutorials and identify the important messages to convey about your university when writing methodology of MMR data manuscript.	https://www.qsrinternational.com/nvivo/nvivo-12-tutorial-windows/00-let-s-get-started https://www.ibm.com/cloud/garage/dte/tutorial/advanced-analytics-ibm-spss-statistics https://www.spss-tutorials.com/
Discuss with the mentor expert in writing methodology of MMR data at your faculty the methods he or she uses to develop a MMR manuscript. What would you have to do differently?	Ask your mentor to suggest a co-researcher who can observe and help you with your practice sessions and the Practice Checklist.
Demonstrate your knowledge of writing methodology of MMR by completing the Self-Check on 2.12	
Check your answers against the Self-Check Model Answers on 2.13.	
Practice writing methodology of MMR data while the academic staff expert in MMR observes and offers help as needed. Ask the academic staff expert in MMR to use the checklist titled "Practice Writing the Methodology of MMR Data" on 2.14 to assess your progress.	

2.1. Determining the title of the manuscript

You should decide what the correct and comprehensive title for the research is by taking care of your research aim so that the title reflects the whole manuscript and makes a sense.

For example if you do a MMR to understand and determine the opinions of bilingual Turkish students on interest and like of children books through drama, the title of your manuscript can be written as

'The effect of creative drama on bilingual students' interest and like of Turkish books ` (Uludüz & Gunbayi, 2018).

2.2. Writing the abstract and key words

You should decide what and how many words of abstract and key words to use to reflect the entire research (aim, methodology, findings and implications) based on database searching engine in the research topic you choose so that abstract and key words should reflect the whole manuscript and makes a sense.

For example for the abstract and key words of the MMR called 'The effect of creative drama on bilingual students' interest and like of Turkish books` (Uludüz & Gunbayi, 2018) to understand and determine the opinions of bilingual Turkish students on interest and like of children books through drama can be as following:

> The aim of this research is to understand and to determine the opinions of bilingual Turkish students on interest and like of children books through drama. It is a mixed methods research with convergent parallel design. The target group was English-Turkish speaking bilingual seven students who attended year 3-5 and lived in Portsmouth. The implementations were held in 2 sessions in drama lessons in a week. The data obtained through the "Turkish Book Reading Interest/like Survey", English Book Reading Interest/like Survey, the 'Student Drama Diary' and the "Leader Diary" written by researcher at the end of the workshop. Also the students' products were used as data in this research. The researchers chose five Turkish books relevant to students'' level and prepared lesson plans including the student acquisitions and the activities based on this books. The results show that bilingual students took part actively in drama sessions and had fun.
> Keywords: Turkish teaching, creative drama, reading children books, bilingualism (Uludüz & Gunbayi, 2018: 29).

2.3. Reviewing the literature

You should decide what philosophies and paradigms to follow based on your cognitive interests: technical, practical, and emancipatory (Gunbayi & Sorm, 2018) and accordingly what reference books, articles, dissertations to review and what scientific search engines to use. The paradigm you choose will shape the decisions you make throughout the entire research process. Review data bases of research field related to your research aim carefully to contribute the research field and to support your research aim and research questions and enable readers to understand why you do this research and what contribution it will make to research field.

> Our activities are determined by our creed or philosophies. Before conducting a social research, we always reckon to our philosophy or research nature behind our study. Here is a social paradigm which is a set of belief that is used to view the social world, and to guide us how to do our actions as well as social scientific study (Gunbayi & Sorm, 2018: 57).

2.4. Explaining the research aim and write research questions

You should decide what and how many research questions both quantitative and qualitative strands of your MMR to write to reach the aim of the research by reviewing the literature related to research topic so that the data you collect and your findings should answer the research questions and keep you up with the research aim.

For example, the research aim and research questions for qualitative strand to understand the school principals' experiences in practicing pedagogical leadership in nurturing teaching and learning in primary schools in the context of Cambodia in the study called 'The principal's praxis of pedagogical leadership in nurturing teaching and learning in Cambodian primary schools' (Sorm, 2019), as it is based on constructivism, can be as follows:

1. In what way do principals develop social capital?
2. In what way do principals develop academic capital?
3. In what way do principals develop intellectual capital?
4. What challenges do school principals encounter in practicing pedagogical leadership?
5. Which dimensions of the pedagogical leadership do school principals practice the most successfully? (Sorm, 2019:7).

For example, the research aim and research questions of the same study done by Sorm (2019) for quantitative strand to determine to what extend do school principals practice pedagogical leadership in nurturing teaching and learning in primary school in the context of Cambodia, as it is based on post-positivism, can be as follows:

1. To what extend do principals practice social capital?
2. To what extend do principals practice academic capital?
3. To what extend do principals practice intellectual capital?
4. To what extend do principals practice professional capital?
5. What are the levels of the difficulties school principals encounter in practicing pedagogical leadership?
6. What are the levels of pedagogical leadership dimensions school principals practice the most successfully? (Sorm, 2019:7-8).

2.5. Explaining which MMR design chosen

You should decide which MMR design- *the convergent parallel design:* the parallel-databases variant, the data-transformation variant, the data-validation variant; *the explanatory sequential design:* follow-up explanations model, participant selection model; *the exploratory sequential design:* instrument-development variant, theory-development variant; *the embedded design:* embedded experimental model, embedded correlational model, embedded instrument development and validation variant; *the multiphase design:* large-scale program, development and evaluation projects, multilevel statewide studies, single mixed methods studies that combine both concurrent and sequential phases; *the transformative design:* the feminist lens transformative variant, the disability lens transformative variant, the socioeconomic class lens transformative variant; *action study:* technical action study, participatory action study, emanciapatory action study (Creswell & Plano Clark, 2011; Gunbayi & Sorm, 2018)- to choose and why based on experience and reference book suggestions of quantitative and qualitative research methods so that the design you choose should comply with your research aim, otherwise you may mislead readers to do study.

For example the explanation of what MMR design was chosen to understand and to determine the opinions of bilingual Turkish students on interest and like of children books through drama (Uludüz & Gunbayi, 2018) can be as following:

> The research is a mixed methods research with convergent parallel pattern. In this pattern, the researcher collects qualitative and quantitative data simultaneously, analyzes two sets of data separately and then interprets (sometimes during data analysis) the results of the data from two sources (Creswell & Plano Clark, 2011). Through the drama lessons of 2-hour sessions per week, applications were carried out. A total of 10-hour applications were conducted in 5 sessions. In order to determine the interest level of the students participating in the study in Turkish book and English book reading, 'Turkish book reading interest and love questionnaire' and 'English book reading interest and love questionnaire' were filled by students. Additionally, in order to understand the interest of the students participating in the study 'student drama diary' and 'Researcher's diary' were used as data collections tools by the researcher. In addition, student products obtained from the sessions are among the data collection tools. The activities of the children were recorded with photos and videos. The researchers identified 5 Turkish children's books in accordance with the level of children and prepared lesson plans in line with the books, and the outcomes and activities to be done were determined. Each session is based on a book. (Uluduz & Gunbayi, 2018: 30-31).

2.6. Explaining sampling methods and techniques

You should decide which sampling methods and techniques should be chosen and why random methods and techniques for quantitative and purposive sampling methods and techniques for qualitative

strands of research should be used based on experience and reference book suggestions of sampling strategy in a research so that the data you collect from the sampling should support your aim and not mislead you.

For example, the sampling methods and techniques chosen for qualitative strand to understand the school principals' experiences in practicing pedagogical leadership in nurturing teaching and learning in primary schools in the context of Cambodia and for quantitative strand to determine to what extend school principals practice pedagogical leadership in nurturing teaching and learning in primary school in the context of Cambodia in the study called 'The principal's praxis of pedagogical leadership in nurturing teaching and learning in Cambodian primary schools' (Sorm, 2019) can be as following:

> For the qualitative strand of the study 4 principals from 4 primary schools in Ponhea lueu district were purposively selected for interview. The main criteria of selection were based on the experiences as principals at least 2 years to participate in in-depth face-to-face semi-structure interview since this amount is sufficient for providing detail information towards designing questionnaire in the second phase for the quantitative strand of the study, 38 principals from 38 primary schools in which 20 were chosen from Punhea Lueu, and 18 were selected from Kandal Steung district. This sample size was opted by using simple random sampling technique since it is a fair way of selecting a sample size from a given population in target districts, consisting small population for quantitative study. (Sorm, 2019:58).

2.7. Explaining data collection methods and techniques

You should explain why and which data collection methods and techniques should be chosen both for quantitative and qualitative strands of research based on experience and reference book suggestions of quantitative and qualitative research methods so that the data you collect from the sampling should support your aim.

For example, explanation of data collection methods and techniques in organizing trainings to introduce Adobe Illustrator as a Technical Drawing Software to technical VET teachers to understand and determine the effect of these trainings on teacher effectiveness in a study called 'Improving technical drawing skills of vet teachers: an action research project' (Gunbayi, Yoruk &Vezne 2017) can be as following:

> Face-to-face interviews were employed and informants' experiences, thoughts and feelings pertaining to the training were recorded in an audio taped diary. Additionally, pre and post-test were applied to participants before and after the trainings to analyze the differences between their opinions before and after the trainings. Interviewers attempted to gather information about the effectiveness of the trainings and necessity of the integration of new technologies into technical drawing courses. (Gunbayi, Yoruk &Vezne 2017: 81).

2.8. Explaining reliability and validity of the research

You should explain what to do to support reliability and validity of the research by doing a pilot study for reliability and validity of the study to guarantee high reliability and validity of the research for both quantitative and qualitative strands.

For example, the reliability and validity explanations of the research called 'The principal's praxis of pedagogical leadership in nurturing teaching and learning in Cambodian primary schools' (Sorm, 2019) with mixed typed exploratory sequential design both for quantitative and qualitative strands of research can be as following:

> In order to ensure reliability of the qualitative interview question, pilot study was conducted with 1 principal before the actual interview in the first phase because it provided the opportunity for researcher to identify or refine questions, correct some errors and make modification… Cohen's Kappa coefficient was calculated to determine inter-rater trustworthiness of themes by two independent researchers…The score was .81 (perfect agreement) (Landis & Koach, 1977).The questionnaire was developed upon the qualitative findings as instrument for collecting empirical quantita-

> tive data… the computation of Cronbach's alpha in this study revealed that the overall score of Likert scale questionnaire in the four capitals is .79. According to Cronbach Alpha index, it runs from 0 to 1… Thus, the Likert scale in this study was reliable and acceptable. (Sorm, 2019: 63)

2.9. Reporting ethical process

You keep up with what steps to follow to conform to the ethics committee of social science researches according to ethical regulations form of the ethical committee and get ethical approval before doing your research both for quantitative and qualitative strands of research. For example, the ethical process of the research done to understand the effect of motivational interview sessions structured according to Roy Adaptation Model on the levels of coping and adaptation processing of individuals diagnosed Type 2 Diabetes Mellitus and called 'The effect of motivational interview program on coping and adaptation processing of individuals diagnosed type 2 diabetes mellitus' (Muslu, 2016), which is an action study with emancipatory design, can be as following:

> Written permission from the hospital was obtained, and ethical approval was taken from Clinical Trials Ethics Committee (Approval no: 206)… Participation in the study was conducted on a volunteer basis and written consent was obtained from all participants. During analysis of interviews codes were used instead of real names. Informed consent form was obtained from the participants (Muslu, 2016: 80).

2.10. Tools, equipment, supplies, and materials

The following tools, equipment, supplies, and materials are needed to write methodology of MMR data.

Table 2.

Tools, equipment, supplies, and materials for enabling objective #1

• Computers	• Quantitative analysis software (SPSS, Lisrel, etc.)
• Textbooks & Articles	• Plagiarism Detection Software
• Databases in related field	• Microsoft Office
• Internet	• Printer/scanner/fax

2.11. Worker behaviors

Academician behaviors play a key role in writing methodology of MMR data. The behaviors important to your success in completing this task are:

Table 3.

Worker behaviors for enabling objective #1

• Assertive	• Punctual
• Flexible	• Ethical Reliable
• Professional	• Objective
• Adaptable	• Goal driven

2.12. Self check

Directions: Check your knowledge of writing methodology of MMR data by responding to the following questions. For True/False questions, circle 'True' if the statement is correct and circle 'False' if the statement is incorrect. For multiple choice questions, select the response that is most correct. For short answer questions, write a brief response to the question. Check your answers with those on the Self-Check Model Answers that follows.

Table 4.

Self check for enabling objective #1

1.	The title of the manuscript should reflect the whole manuscript and make a sense. True False
2.	Key words reflect the whole manuscript and make a sense. True False
3.	Literature review supports your research aim and research questions and readers can understand why you do this research and what contribution you do to both qualitative and quantitative research fields. True False
4.	Write MMR questions mutually. True False
5.	Identify the types of designs and their variants in a MMR
6.	The sampling method which supports a quantitative strand of MM research can be (choose more than one): a. Probability sampling b. Non-probability sampling c. Purposive sampling d. Random sampling
7.	Identify the types of validity and reliability in a MMR
8.	Why is the importance of ethics in your research? Give your reasons

2.13. Self-check model answers

Directions: Compare your answers to the self-check with the model answers provided below.

Table 5.

Self-check model answers for enabling objective #1

1.	True	
2.	True	
3.	True	
4.	False	Write research questions for both quantitative and qualitative strands of research separately.
5.	Model Answer	You can choose your mixed methods design and its variant according to research aim e.g. the convergent parallel design: the parallel-databases variant, the data-transformation variant, the data-validation variant; the explanatory sequential design: follow-up explanations model, participant selection model; the exploratory sequential design: instrument-development variant, theory-development variant; the embedded design: embedded experimental model, embedded correlational model, embedded instrument development and validation variant; the multiphase design: large-scale program, development and evaluation projects, multilevel statewide studies, single mixed methods studies that combine both concurrent and sequential phases; the transformative design: the feminist lens transformative variant, the disability lens transformative variant, the socioeconomic class lens transformative variant; action study: technical action study, participatory action study, emanciapatory action study.

Table 5 Continue

6.	a. d.	Probability sampling Random sampling
7.	Inner Validity	• Triangulation (Qualitative Strand) • Choosing an appropriate methods of measurement (Quantitative Strand)
	Outer Validity	• A purposive sampling method based on voluntarism to get opinions and experiences (Qualitative Strand) • A probability sampling methods to select your subjects (Quantitative Strand)
Model Answer	Inner Reliability	• Data should be coded by independent researchers and Cohen's kappa coefficient calculated to determine inter-rater reliability of themes (Qualitative Strand) • Measurements should be applied consistently. (Quantitative Strand)
	Outer Reliability	• All data collected should be kept to prove on demand. (Qualitative Strand) • The conditions of research should be standardized. (Quantitative Strand)
8.	Model Answer	'If you do not keep up with ethical procedures in the research, your research become meaningless and you can get some penalties by the ethical committee in your institution and as a scientist you have a bad reputation' (Gunbayi, 2018).

2.14. Practice exercise

You should follow directions below for Practice exercise for enabling objective #1:

- Review your ability to write the methodology of MMR data using the following checklist as a guide.
- Discuss with your co-researcher the fundamentals of this task.
- Practice each stage of writing methodology of MMR data.
- Ask your co-researcher to use the checklist to evaluate your ability to perform this task.

Table 6.

Practice exercise for enabling objective #1

Writing the Methodology of Mixed methods Data			
Actions	**Level of Performance**		
	Yes	**With Help**	**No**
When writing the methodology of mixed methods data, the learner…			
1. Determined title appropriate with the manuscript.			
2. Completed abstract and key words that reflected the content accurately.			
3. Defined the research problem clearly, tied to the relevant literature, up to date, completed with literature review with appropriate references.			
4. Determined research questions appropriate with research aim both quantitative and qualitative strands of research.			
5. Selected mixed typed design consistent with the aim of the research.			
6. Explained sampling methodology, chose correct sampling size for both quantitative and qualitative strands of research.			
7. Explained data collection method through qualitative (semi-structured individual and focus group interviews, organized observations and collected documents) and quantitative (Experiments, surveys, tests and scales) forms and instruments.			
8. Followed steps to ensure reliability and validity of the study for both quantitative and qualitative strands of research.			

Level of Performance: When you finish this Practice Exercise, you should be able to comfortably discuss and perform any of the actions included in it. Your ratings on the checklist for this Practice Exercise should be Yes for all items. If you receive With Help or No ratings for any items, review your performance with your mentor.

3. Analyzing MMR Data

As seen in Table 7: Learning experience #2, you should follow the steps of learning activities by taking care of special instructions in practice analyzing MMR data.

Table 7.

Learning experience #2

Enabling Objective #2: Practice Analyzing Mixed methods Data	
Learning Activities	**Special Instructions**
Read the Information Sheet titled 'Practice Analyzing MMR Data' on 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 and 3.8.	
Watch the qualitative data analysis video, read quantitative data analysis tutorials and identify the important messages to convey about your university when analyzing MMR data.	https://www.qsrinterna-tional.com/nvivo/nvivo-12-tutorial-win-dows/00-let-s-get-started https://www.ibm.com/cloud/garage/dte/tu-torial/advanced-analytics-ibm-spss-statistics https://www.spss-tutorials.com/
Discuss with the mentor expert in MMR at your faculty the methods he or she uses to analyze MMR data. What would you have to do differently?	
Demonstrate your knowledge of analyzing MMR data by completing the Self-Check on 3.9	
Check your answers against the Self-Check Model Answers on 3.10	Ask your mentor to suggest a co-researcher who can observe and help you with your prac-tice sessions and the Practice Checklist.
Practice Analyzing MMR data while the academic staff expert in MMR observes and offers help as needed. Ask the aca-demic staff expert in MMR to use the checklist titled 'Prac-tice Analyzing Mixed methods Data 'on 3.11 to assess your progress.	

Prior data analysis, you should decide how to analyze MMR data separately or conqurently by taking interaction, timing, priority and mixing of qualitative and quantitative data into consideration based on what mixed typed designs or variants choosen as seen in Figure 1.

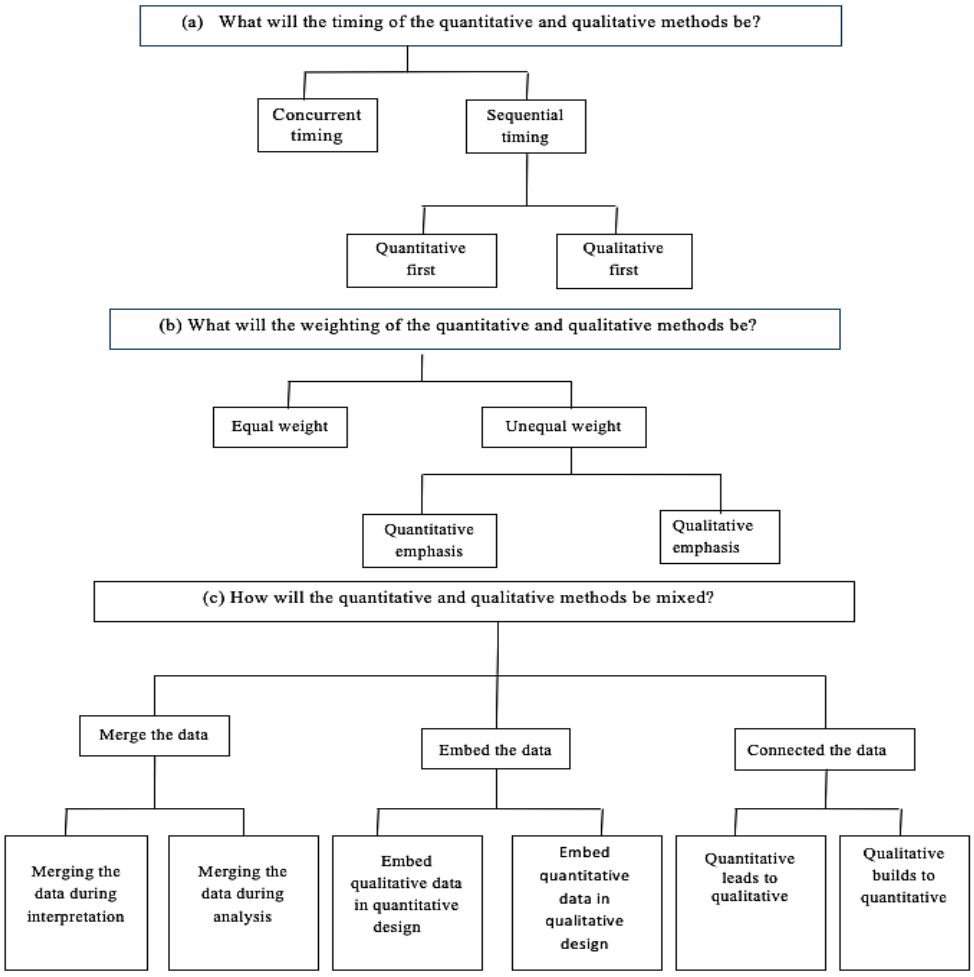

Figure 1. *Decision tree for mixed methods design criteria for timing, weighting, and mixing.*
Source: Adapted from Creswell, J. W., & Plano Clark, V. L. (2011). Designing and conducting mixed methods research (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.

3.1. Organizing qualitative data categorically and chronically

In qualitative strand, data analysis should be done with repeated readings of interview transcripts from conversations with participants. The purpose is to determine the essence of the phenomenon and structures of experiences of participants on the topic of research. During data analysis, data should be organized categorically and chronically, reviewed repeatedly and continually coded as seen in Figure 2. Interview transcripts should be regularly reviewed. In addition, data analysis process can be aided by the use of a qualitative data analysis computer program called NVIVO. However, remember that these kinds of computer programs do not actually perform the analysis but facilitate and assist it. That is NVIVO does not perform the analysis but only supports the researcher doing the analysis by organizing data and recodes and nodes etc.

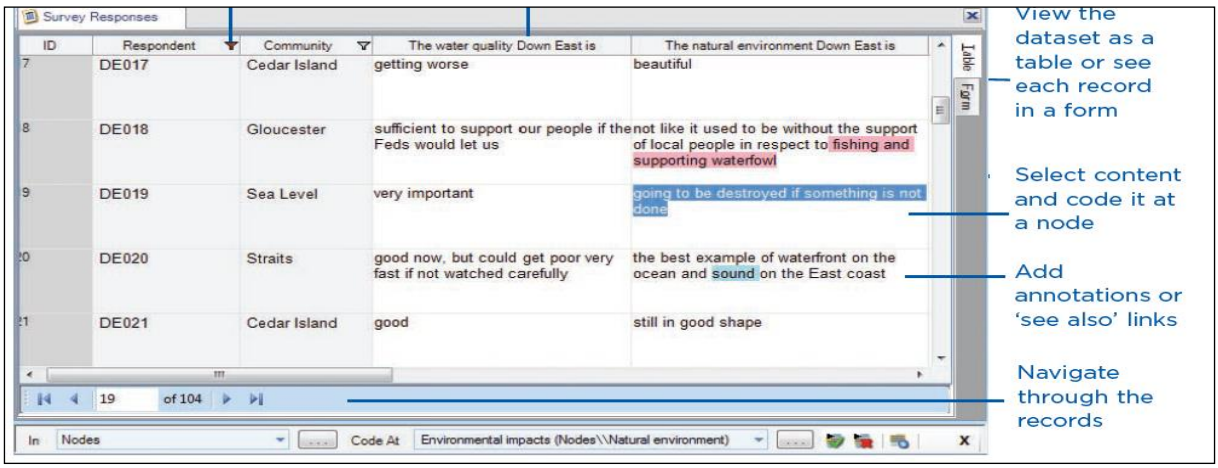

Figure 2. Coding by using qualitative software NVIVO
Source: QSR (2019)

For example, in the article, called 'Improving technical drawing skills of VET teachers: An action research' (Gunbayi, Yoruk & Vezne, 2017) and the aim of which was to improve technical drawing skills of VET teachers, the thematic analysis of 15 participants of trainers related to whether their expectations were fulfilled based on themes and sub-themes coded can be seen in Figure 3.

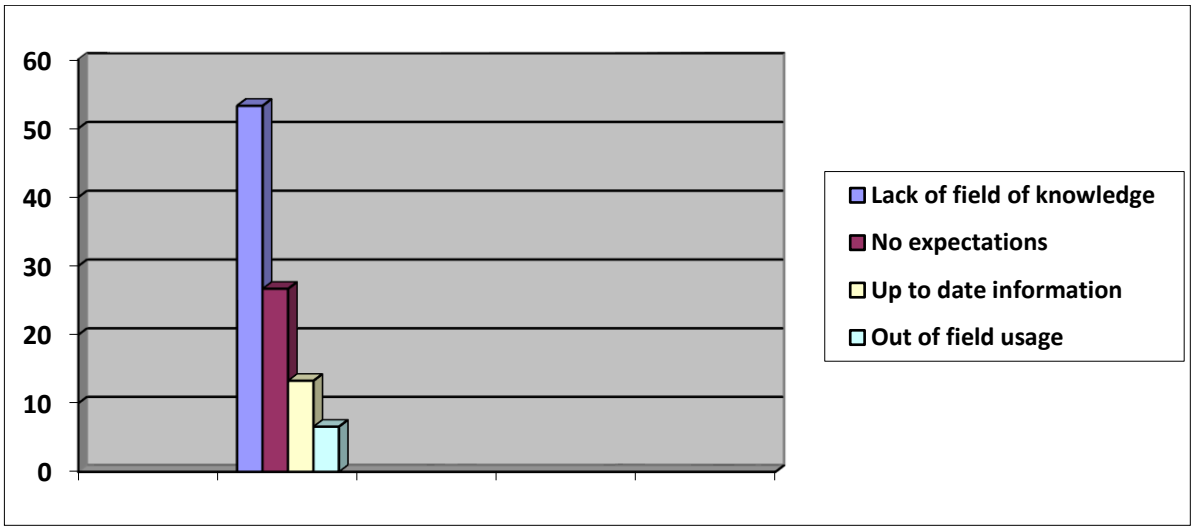

Figure 3. Fulfilling expectations
Source: Gunbayi, Yoruk & Vezne (2017)

3.2. Analyzing the findings of qualitative data collected via interviews descriptively and doing content analysis

As explained in 3.1., you should first transcript your individual interviews, review repeatedly and continually code by using qualitative software NVIVO.

Then as seen in Table 8, you can show frequency analysis for the opinions of the participants of trainers on whether their expectations were fulfilled in training to improve their technical drawing skills in the study done by Gunbayi, Yoruk & Vezne (2017) based on themes and sub-themes coded and under this table you can analyze the data descriptively as follows:

Table 8.

Fulfilling expectations

Fulfilling Expectations	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	f
Lack of field knowledge	√					√		√	√	√		√	√	√		8
No expectation				√	√		√								√	4
Up-to-date information			√								√					2
Out of field usage		√														1

Source: Gunbayi, Yoruk & Vezne (2017: 83)

As seen in Table 8, 8/15 of participants stated that they increased their field knowledge follows:

> When Table 8 is examined, it can be understood that 4 participants had no expectations from training. 8 participants stated that they increased their field Knowledge. The opinions of participants are as follows:
>
> TED-VET training course fulfilled my expectations. Before this, I have never had a graphical training or used graphic program. Also, my basic knowledge was lacking too. With this course I believe I have learned how to use a program especially about technical drawing. (A1,1)
>
> This training fulfilled my expectations because I graduated from university 12 years ago, and since then, I have never tattended a graphical-based drawing training neither from Ministry of National Education nor from another institution. I have never participated in a training like this. I needed it time to time. Especially technical drawing. This training met my needs. (F1,1)
>
> I came to the course with curiosity because I was going to learn new program. I was satisfied, it fulfilled my expectations. Since I am a Construction Technologies teacher, drawing is important in our field. I came because it is a new program, something I don't know and I said that I am glad I learned. I think that I didn't come in vain. (L1,1) (Gunbayi, Yoruk & Vezne, 2017:84)

When completed analyzing data descriptively, now it is time for you do content analysis. Content analyses enable you to analyze the data in depth by explaining the relation between independent variables and dependent variables.

For example, in the same research done by Gunbayi, Yoruk & Vezne (2017) the content analysis of the opinions of the teachers working in Vocational and Technical High School on whether their expectations were fulfilled in training to improve their technical drawing skills based on findings in Table 9, can be as follows:

> In 'Fulfilling the Expectations' theme, most of other teachers stated that they participated because they wanted to improve their vocational knowledge. It can be understood that teachers did not see themselves qualified enough about technical drawing and technical drawing with computers… When interviews were analyzed, it can be seen that participants especially working in information technologies were more advantageous. Information technologies teachers were familiar with a lot of software because of their field and they did not have any problems in doing preparations for trainings. Although they did not know anything about the software used during training, knowing at least one graphic software helped them. (Gunbayi, Yoruk & Vezne, 2017:88)

Table 9.

Row percentage of fulfilling expectations

Fulfilling Expectations	Teachers of Information Technologies	Other Teachers
1 : Lack of field knowledge	37,50%	62,50%
2 : No expectation	75,00%	25,00%
3 : Up-to-date information	0%	100%
4 : Out of field usage	0%	100%

Source: Gunbayi, Yoruk & Vezne (2017)

3.3. Analyzing the findings of qualitative data collected via focus group interviews

When you discuss data of focus group interviews, you should first transcript your focus group interviews, review repeatedly and continually code as you do in 3.1 and 3.2.

For example, the thematic and descriptive analysis of focus group data for the study of 'Making vocational and technical upper secondary schools more attractive for students to prefer: An action research' (Gunbayi & Akcan, 2015) done to help the students to identify professions appropriate with their abilities, interests and personality traits and to guide the students to technical and vocational training especially at upper secondary level with their own will can be as following:

> Firstly, when six students in focus group were asked again after presentations and school visits whether they would prefer TVET upper secondary schools for their high school education, three of them said 'Yes', one 'No' and two were neutral for their preferences. Additionally, six of them explained the reasons why they wanted or did not want or were neuter to prefer TVET secondary education as 'guidance by parents to Anatolian General High School.'(SP9), 'dual system in TVET courses at school and practice and work in an enterprise' (SP14), 'preferring a TVET high school due to lower entrance scores' (SP22, SP15), 'reluctant to attend a TVET high school'(SP20, SP2), and 'TVET high schools are in secondary position for me'. (Gunbayi & Akcan, 2015: 23).

3.4. Analyzing the findings of qualitative data collected via observations

When you discuss data of your observation, you should first organize your observation notes, review repeatedly and continually code as you do in 3.1 and 3.2.

For example, descriptive and content analysis of observations for the study of 'Job Stressors and their effects on academic staff: A case study' (Gunbayi, 2014) done to understand the kinds of stressors originating from academic work setting, the influences of those kinds of stressors on academic staff and to know how they overcame stress at work setting can be as following:

> In the observation of PDC's own classroom at 13:30 on 26 March 2012, just before the focus group interview, just opposite the board there were desks for students designed in U style but in double U designs one front another was just back of it. In each U designs there were chairs for 22 students all together for 44 students. This design clearly showed that spaces in the classrooms did not meet the increasing number of students, which was a source of stress, as PDC stated in individual and focus group interviews. This design was also observed at PDA's lecture at 11.30-12.30 on 24 April 2012 at Demerstraatin in Diest Campus. PDA stated that 'I use double U designs to overcome the difficulty of lecturing in crowded classes'. (Gunbayi, 2014: 67-68)

3.5. Analyzing the findings of qualitative data collected via documents

When you discuss data of documents, you should first review repeatedly and continually code the data collected via documents as you do in in 3.1 and 3.2.

For example, descriptive and content analysis of the data collected via documents for the same study as in 3.4. by Gunbayi (2014) done to understand the kinds of stressors originating from academic work setting, the influences of those kinds of stressors on academic staff and to know how they overcame stress at work setting can be as following:

> Lecturers were asked about what their perceptions on stressors originating from academic work setting were. The analyses of 12 academic staff's perceptions on stress as a result of stressors originating from academic work setting showed that 100% of academic staff complained about workload. Thus Weekly schedules of all participants were analyzed in terms of their workload and types of work in … spring semester. Except PDB, PDD, PLB, PLD and PDF, all participants worked full time during the academic semester...PDA coached eight students, PDB twelve, PDC nineteen, PDD and PLE twelve, and PDF fourteen, PLC five, PLD seventeen and PLF thirty. PDA visited schools for observing practical teacher training of students two days a week… (Gunbayi, 2014: 68).

3.6. Analyzing the findings of quantitative data collected via experiments, questionnaires, scales, and tests

In quantitative strand, data analysis should be done with the results of experiments, quasi-experiments, questionnaires, scales, and tests etc. Using quantitative research methods such as experiments, quasi-experiments, surveys, correlation studies, longitudinal studies and so on based on objective measurement and analysis is the only acceptable method to generate valid knowledge in positivist paradigms of radical structuralism and functionalism (Gunbayi & Sorm, 2018). The purpose is to collect numerical data that can be subjected to statistical analysis. In addition, numerical data analysis process can be aided by the use of a quantitative data analysis computer program called SPSS.

For example in the article called 'Improving technical drawing skills of VET teachers: An action research' (Gunbayi, Yoruk & Vezne, 2017) done to improve technical drawing skills of VET teachers, the analysis of pre-test and post-test results before and after trainings can be as following:

> In the second phase of the research, pre-test and post-test were also applied to 15 trainers and 303 teachers who attended trainings. The aim of this pre and post-test was to measure the sufficiency and necessity of the training. Paired samples t-test was used to analyze the results. The averages of pre-test and post-test answers were calculated and these averages were analyzed with paired samples t-test. Results can be seen in Table 10 and 11.

Table 10. Paired samples t-test results of pre-test and post-test

Measurement	N	X	SS	Sd	t	p
Pre - Test	318	2.17	0.15	302	216.59	.000
Post - Test	318	4.52	0.12			

> There was a significant difference between pre-test and post-test answers as it can be seen in Table 7. When averages were analyzed, participants' post-test results (X=4.52) about vocational training knowledge, adult training knowledge and post training organizations were much higher than pre-test results (X=2.17). Also, as seen in Table 8, correlation analysis result was very low at 0.019, which meant there was no meaningful relation between these two variables, and it supported the results in Table 10.

Table 11. Correlation of pre-test and post-test points

	N	Correlation
Pre-Test Score & Post-Test Score	318	,019

(Gunbayi, Yoruk & Vezne, 2017: 87-88)

3.7. Tools, equipment, supplies, and materials

The following tools, equipment, supplies, and materials are needed in analyzing MMR data:

Table 10.

Tools, equipment, supplies, and materials for enabling objective #2

- Voice recorder
- Camera
- Computers
- Textbooks, Articles
- Databases in related field
- Disseratations
- Quantitative analysis software (SPSS, Lisrel, etc.)
- Qualitative Analysis Software (NVIVO)
- Plagiarism Detection Software
- Microsoft Office
- Internet
- Printer/scanner/fax

3.8. Worker behaviors

Academician behaviors play a key role in analyzing MMR data. The behaviors important to your success in completing this task are:

Table 11.

Worker behaviors for enabling objective #2

• Careful	• Self-motivated
• Detail oriented	• Flexible
• Hard working	• Trustworthy
• Creative	• Adaptable
• Innovative	• Ethical Reliable

3.9. Self check

Directions: Check your knowledge of practicing analyzing mixed methods data by responding to the following questions. For True/False questions, circle 'True' if the statement is correct and circle 'False' if the statement is incorrect. For multiple choice questions, select the response that is most correct. For short answer questions, write a brief response to the question. Check your answers with those on the Self-Check Model Answers that follows.

Table 12.

Self check model questions for enabling objective #2

1.	Identify the main reason for why mixed methods data is used in a single study.
2.	Identify the steps in analyzing qualitative data.
3.	During quantitative data analysis, the data should be organized categorically and chronically, reviewed repeatedly and continually coded True False
4.	In……..you can analyze the data in depth by explaining the relation between independent variable and dependent variable. a. Thematic Analysis b. Descriptive Analysis c. Content analysis d. Kappa
5.	What is the difference between NVIVO and SPSS softwares?

3.10. Self-check model answers

Directions: Compare your answers to the self-check with the model answers provided below.

Table 13.

Self-check model answers for enabling objective #2

1.	Model Answer	Mixed methods data provide a more complete understanding than either quantitative or qualitative alone
2.	Model Answer	Qualitative data analysis includes three steps: thematic analysis, descriptive analysis and content analysis.
3.	False	During quantitative data analysis data are organized in terms of numbers based on the results of experiments, quasi-experiments, questionnaires, scales, tests.
4.	c	Content analysis
5.	Model Answer	A qualitative data analysis program NVIVO supports the researcher doing the analysis qualitative data by organizing data and recodes and nodes etc. and it provides a workspace and tools to enable researchers to easily work through their information. On the other hand SPSS statistics software is used to perform only statistical operations of quantitative data.

Level of Performance: Your responses to the items on the Self-Check should match the Self-Check Model Answers. If you miss some points or have questions, review the Information Sheet, or if necessary, consult with your mentor.

3.11. Practice Exercise

You should follow directions below for practice exercise for enabling objective #2:

- Conduct the activities listed below using the following checklist.
- Continue practicing until you achieve a Yes rating for every item on the checklist provided in this Practice Exercise.
- Ask your co-worker to check your practice using the checklist below.

Table 14.

Practice exercise for enabling objective #2

Analyzing MMR Data			
Actions	**Level of Performance**		
	Yes	**With Help**	**No**
When analyzing MMR data, the learner…			
1. Determined to analyze MMR data separately or conqurently by taking interaction, timing, priority and mixing of qualitative and quantitative data into consideration based on what mixed typed designs or variants choosen			
2. Organized data categorically and chronically, reviewed repeatedly continually coded in qualitative strand			
3. Analyzed findings of qualitative data collected via individual interviews			
4. Analyzed findings of qualitative data collected via focus group interviews			
5. Analyzed findings of qualitative data collected via observations			
6. Analyzed findings of qualitative data collected via documents			
7. Organized data collected via experiments, questionnaires, scales and test etc. in terms of numbers in quantitative strand			
8. Analyzed findings of quantitative data collected via experiments, questionnaires, surveys, scales and test etc. in terms of numbers			

Level of Performance: When you finish this practice exercise, you should be able to comfortably discuss and perform any of the actions included in it. Your ratings on the checklist for this Practice Exercise should be Yes for all items. If you received With Help or No ratings for any items, review your performance with your mentor.

4. Discussing and Concluding Results

As seen in Learning Experience #3, you should follow the steps of learning activities by taking care of special instructions in Practice Discussing and Concluding Results of MMR Data.

Table 15.

Learning experience #3

Enabling Objective #3: Practice Discussing and Concluding Results of MMR Data	
Learning Activities	**Special Instructions**
Read the Information Sheet titled 'Practice Discussing and Concluding Results of MMR Data' on 4.1, 4.2, 4.3 and 4.4, 4.5 and 4.6.	
Watch the discussing and concluding results of MMR data analysis video, read quantitative data analysis tutorials and identify the important messages to convey about your academic position at university when discussing and concluding results of MMR data.	https://www.qsrinternational.com/nvivo/nvivo-12-tutorial-windows/00-let-s-get-started https://www.ibm.com/cloud/garage/dte/tutorial/advanced-analytics-ibm-spss-statistics https://www.spss-tutorials.com/
Discuss with the mentor expert in MMR at your faculty how he or she uses to discuss and to conclude MMR data. What would you have to do differently?	
Demonstrate your knowledge of discussing and concluding results of MMR data by completing the Self-Check Model Questions on 4.7.	
Check your answers against the Self-Check Model Answers on 4.8.	
Practice Discussing and Concluding Results of MMR Data while the academic staff expert in MMR observes and offers help as needed. Ask the academic staff expert in MMR to use the checklist titled 'Practice Discussing and Concluding Results of MMR Data 'on 4.9 to assess your progress.	Ask your mentor to suggest a co-researcher who can observe and help you with your practice sessions and the Practice Checklist.
Arrange to complete this Learning Guide titled 'Systematic curriculum and instructional development for a mixed methods research: SCID-MMR' by asking your mentor to evaluate your performance using the criteria in the Performance Test on 5, 5.1.	

4.1. Discussing results of MMR

You should decide which findings to take priority and discuss analytically by focusing on what findings really contribute to the phenomena of your research in the studies done so far and what are the similarities and differences between your MMR and studies done so far so that you can contribute to relevant research literature.

For example, analytical discussion on what qualitative and quantitative findings really contribute to the phenomena of the research via an independent level of interaction based on drawing conclusions of qualitative and quantitative findings during the overall interpretation at the end of the research in the study which is called 'Making vocational and technical upper secondary schools more attractive for students to prefer: An action research' (Gunbayi & Akcan, 2015) and which was done in MMR with technical action study design to help the students to identify professions appropriate with their abilities, interests and personality traits and to guide the students to technical and vocational training especially at upper secondary level with their own will can be seen as follows:

> Vocational high schools are the least prestigious… Thus, there are not so many students who attend vocational high schools through their own choice (Katsu & Vorkink et al. 2005)… the student SP18's gold metaphor for TVET high schools and his explanation as '…Because to acquire the qualifications of a profession is very worthy. Every graduate of TVET high schools has his or her profession and he or she can faster and more easily find a job and start work.

> Besides he or she can improve own career at work.' support the finding that TVET high schools are seen as golden opportunity for students to be employed in labor market and in career. This finding was also promising in that the attractiveness of TVET high schools had increased recently…Finally, as a result of this action research there was a promising difference in terms of the proportional change between the number of the students who graduated from junior high school in the sample and attended to technical and vocational upper secondary schools last year and the number of the students in the sample who have graduated from junior high school and then who will attend to technical and vocational high schools this year as thirty-four (82.92) of forty-one students, thirteen (31.70) in their first preferences, three (7.31) in their second preferences, six (14.63) in their third preferences, the rest nineteen (46.34) in their last seven preferences in order, preferred TVET high schools and their vocational programs. This finding was also promising in terms of 9th Development Plan (2007-2013) in Turkey, which investigated that the 65 % of the students are to be enrolled to the VET high schools and the remaining part is to attend the general education high schools (SPO, 2006) and also supported the aim of this action research and showed how well the action plan worked (Gunbayi & Akcan, 2017:14-26).

4.2. Summarizing and concluding results of MMR

You should decide what significant conclusion to write consistent with your findings so that readers who have a quick look to review the summary and conclusion of the research may have no idea on your MMR and can cite your research.

For example, summarizing and concluding of the MMR in technical action study design done to organize trainings to introduce Adobe Illustrator as a Technical Drawing Software to technical VET teachers (Gunbayi, Yoruk & Vezne, 2017), to understand and to determine the effect of these trainings on teacher effectiveness can be as follows:

> The purpose of the study was to understand and to determine the level of improvement in VET technical drawing teachers who participated in multiple training opportunities…In the interviews following the training, teachers expressed their expectations from training, preparation before training and the training's effect on their professional development and knowledge. In the 'Fulfilling the Expectations' theme, most of teachers stated that they participated because they wanted to improve their vocational knowledge…A paired samples t-Test analysis was conducted utilizing the mean scores of the pre and post-tests. According to the analysis, there was a significant statistical difference between these pre-test and post-test scores. This significant difference meant that trainings were done successfully because the post-test scores were more positive. Participants' technical drawing skills level before and after the training was not the same. After the training, participants believed their knowledge was greater and they also thought that computers should be used in technical drawing because of how well the software created new pathways to their learning and how to utilize their knowledge in teaching. (Gunbayi, Yoruk & Vezne 2017: 89).

4.3. Reporting recommendations of MMR

You should decide what recommendations to put forward both for practitioners and researchers by suggesting attractive and innovative recommendations consistent with your findings so that your published research may influence prospective researchers, you can lead them and you can be a familiar scholar in your own field.

For example reporting recommendations of the research in the study called 'Making vocational and technical upper secondary schools more attractive for students to prefer: An action research' (Gunbayi & Akcan, 2015) with a participatory action study design based on qualiatative and quantitative results can be as follows:

> ..all partners had better be aware of the difficulties and problems which are likely to affect the prestige and attractiveness of TVET high schools negatively in order to create an improved, up-to-date, well organized TVET high schools according to the requirements of the changing labor market needs and thus more attractive to prefer. Therefore,promotional activities and introductions to junior high school students for technical and vocational upper secondary schools are essential to attract more students to TVET high school education and thus to decrease the number of unemployment of educated adults. (Gunbayi & Akcan, 2015: 27).

4.4. Writing references and adding appendices of MMR

You are supposed to decide how to organize references in number or alphabetical order by taking care of author guidance of the journal you will submit for publication and its manuscript writing guidelines. Otherwise, the manuscript can be rejected or sent you back for redesigning by the reviewers and editors of a journal.

For example, an organization and writing of references of the article called 'Making vocational and technical upper secondary schools more attractive for students to prefer: An action research' (Gunbayi & Akcan, 2015) according guidelines of International Journal on New Trends in Education and Their Implications (IJONTE) can be as follows:

Table 16.

A sample of writing of references

References
Bozgeyikli, H. & Isıklar, A. (2011). An obstacle of guiding students to apprenticeship training center: negative parent opinions. *Selcuk Universitesi Sosyal Bilimler Enstitüsü Dergisi*, 25, 33-45.
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Katsu S., Vorkink A. N., Griffin, C. C., McLaughlin, M. A. & Horn, R. S. (2005). *Turkey education-sector study sustainable pathways to an effective, equitable, and efficient education system for preschool through secondary school education*. December 31, 2005, 32450-TU, Document of The World Bank.
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Source: Gunbayi & Akcan (2015:28-29)

You should also add appendices such as consent form, ethical committee approval and formal permission such as Institutional Review Board (IRB) approval got from institutions, interview forms, questionnaires and so on. An example of consent form can be as follows:

Table 17.

A sample of consent form

Consent Form

…. /…. / 2018

My signature on this form indicates that I agree to participate in a study conducted by Sath SORM on 'The Principal's Praxis of Pedagogical Leadership in Nurturing Teaching Aad Learning in Cambodian Primary Schools'. It also shows that I read and understand before providing information as follows:

- I am volunteer and can withdraw at any time from the study.
- There is no risk of physical or psychological harm.
- The information I give will be strictly confidential and all the data will be collected and analyzed by the researcher and will be securely kept secretly. Then, it will be destroyed after the report is officially submitted.
- I will receive a summary of the study upon request.
- I am giving permission to the researcher for the research and its results being published.

I, ……., agree to participate in this data collection.

_____ _____

Signature of the Participant Date

Source: Adapted from Sorm, S. (2019). The principal's praxis of pedagogical leadership in nurturing teaching and learning in Cambodian primary schools, (Unpublished doctoral dissertation. Akdeniz University, Antalya, Turkey.

4.5. Tools, equipment, supplies, and materials

The following tools, equipment, supplies, and materials are needed to discussing and concluding results of MMR data.

Table 18.

Tools, equipment, supplies, and materials for enabling objective #3

- Computers
- Textbooks and Articles
- Databases in related field
- Qualitative and Quantitative analysis software (SPSS, Lisrel, NVIVO etc.)
- Plagiarism Detection Software
- Microsoft Office
- Internet
- Printer/scanner/fax

4.6. Worker behaviors

Worker behaviors play a key role in discussing and concluding results of MMR data. The behaviors important to your success in completing this task are:

Table 19.

Worker behaviors for enabling objective #3

- Proactive
- Leader
- Open-minded
- Creative
- Innovative
- Assertive
- Flexible
- Trustworthy
- Adaptable
- Objective

4.7. Self check

Directions: Check your knowledge of discussing and concluding results of a MMR data by responding to the following questions. For True/False questions, circle 'True' if the statement is correct and circle 'False' if the statement is incorrect. For multiple choice questions, select the response that is most correct. For short answer questions, write a brief response to the question. Check your answers with those on the Self-Check Model Answers page that follows.

Table 20.

Self check model questions for enabling objective #3

1.	You should decide where and how to mix the quantitative and qualitative strands while discussing the findings and which findings to take priority and discuss analytically. True False
2.	You do not necessarily write significant conclusion consistent with your findings. True False
3.	When does a researcher mix quantitative and qualitative strands in a MMR if he/she decides an independent level of interaction of mixed research data?
4.	How should you organize references? Why?
5.	Why should you decide what recommendations to put forward both for practitioners and researchers by suggesting attractive and innovative recommendations consistent with your findings? Give your reasons.

4.8. Self-check model answers

Directions: Compare your answers to the Self-Check with the Model Answers provided below.

Table 21.

Self check model answers for enabling objective #3

1.	True	
2.	False	Readers who has a quick look to review literature may not have no idea on your MMR and do not cite your research.
3	Model Answer	The researcher only mixes the two strands when drawing conclusions during the overall interpretation at the end of the study.
4.	Model Answer	You are supposed to organize references in number or alphabetical order by taking care of author guidance of the journal you will submit for publication and its manuscript writing guidelines. Otherwise, the manuscript can be rejected or sent you back for redesigning by the reviewers and editors of a journal.
5.	Model Answer	As a scholar your published manuscript may influence prospective researchers so you can lead them and you can be a familiar scientist in your own field

Level of Performance: Your responses to the items on the Self-Check should match the Self-Check Model Answers. If you miss some points or have questions, review the Information Sheet, or if necessary, consult with your mentor.

4.9. Practice test

You should follow the following directions for Practice Exercise for Enabling Objective #3:

- Conduct the activities listed below using the following checklist.
- Continue practicing until you achieve a Yes rating for every item on the checklist provided in this Practice Exercise.
- Ask your co-worker to check your practice using the checklist below.

Table 22.

Practice test for enabling objective #3

Discussing and Concluding MMR Results			
Actions	**Level of Performance**		
	Yes	**With Help**	**No**
When discussing and concluding results of a MMR data, the learner…			
1. Discussed findings using main topics according to findings of qualitative and quantitative data collected according to MMR design chosen			
2. Outlined why this study is done and its implications			
3. Reported recommendations both for practitioners and researchers			
4. Ordered references systematically and consistently			
5. Kept appendices for outer reliability			

Level of Performance: When you finish this Practice Exercise, you should be able to comfortably discuss and perform any of the actions included in it. Your ratings on the checklist for this Practice Exercise should be Yes for all items. If you received With Help or No ratings for any items, review your performance with your mentor. After this, ask your mentor to help you practice your skills further.

5. Performance Test

You are to perform the task for developing a MMR manuscript based on SCID as required. Your mentor will evaluate your performance using the criteria in Performance Test and Performance Standards in Table 23 and Table 24 below.

Table 23.

Performance test for developing a MMR manuscript.

Learner's Name:	Date	
Competency: ***Developing a MMR manuscript based on SCID.***	**Test Attempt** 1st 2nd 3rd	
Mentor's Signature/Approval	**Overall Evaluation**	
	Level Achieved	**Performance Levels**
		4 – Can perform this skill without supervision and with initiative and adaptability to problem situations.
Directions: Your mentor will provide you one or more opportunities to a MMR manuscript. You are to perform the actions needed to deal with the situation that meets your academic requirements and research ethical practices. Your mentor will evaluate your performance using the criteria listed below.		3 – Can perform this skill satisfactorily without assistance or supervision
		2 – Can perform this skill satisfactorily, but requires some assistance and/or supervision.
		1 – Can perform parts of this skill satisfactorily, but requires considerable assistance and/or supervision.
	Mentor will initial level achieved.	

5.1. Performance standards

After performing the task for developing a MMR manuscript, you should fill in performance standards. In case any item receives a NO response, you should consult with your mentor to determine what

additional activities you need to achieve competency in the weak area(s) in developing a MMR manuscript based on SCID.

Table 24.

Performance standards for developing a MMR manuscript based on SCID

For acceptable achievement, all items should receive a 'Yes' or 'N/A' response.	**Yes**	**No**	**N/A**
When developing a MMR manuscript, the learner…			
1. Defined the research problem and aim clearly,			
a. Tied to the relevant literature,			
b. Up to date,			
c. Completed with literature review with appropriate references			
2. Determined research questions appropriate with research aim for both quantitative and qualitative strands of research			
3. Explained what mixed typed designs and variants chosen:			
a. The convergent parallel design: The parallel-databases variant, The data-transformation variant, the data-validation variant			
b. The explanatory sequential design: Follow-up explanations model, participant selection model			
c. The exploratory sequential design: Instrument-development variant, theory-development variant			
d. The embedded design: Embedded experimental model, embedded correlational model, embedded instrument development and validation variant			
e. The multiphase design: Large-scale program development and evaluation projects, multilevel statewide studies, single mixed methods studies that combine both concurrent and sequential phases			
f. The transformative design: The feminist lens transformative variant, the disability lens transformative variant, the socioeconomic class lens transformative variant			
g. Action Study: Technical action study, particiapatory action study, emancipatory action study			
4. Selected mixed methods design consistent with the aim of the research			
5. Explained sampling methodology, chose correct sampling size for both quantitative and qualitative strands of research			
6. Explained data collection method for both quantitative and qualitative strands of research			
a. Qualitative strand: interviews:individual and focus group, participatory observations, documents			
b. Quantitative strand: experiments, questionnaire, scales, tests, annual statistics etc.			
7. Followed steps to ensure reliability and validity of the study for both quantitative and qualitative strands of research			
8. Accurately reported ethical procedures (e.g. Avoided plagiarism, guaranteed anonymity of the participants, obtained participants' written consent, formal permissions, institutional Review Board (IRB))			
9. Analyzed MMR data separately or conqurently by taking interaction, timing, priority and mixing of qualitative and quantitative data into consideration based on what mixed typed designs or variants choosen			
a. Organized qualitative data -interviews:individual and focus group, participatory observations, documents- categorically and chronically, reviewed repeatedly, continually coded			
b. Organized quantitative data- experiments, questionnaire, scales, tests, annual statistics etc.- in terms of numbers			

Table 24 Continue

For acceptable achievement, all items should receive a 'Yes' or 'N/A' response.	**Yes**	**No**	**N/A**
10. Discussed findings using main topics of findings of qualitative and quantitative data collected according to MMR design chosen via: a. Qualitative strand: Interviews-individual and focus group, participatory observations, documents			
b. Quantitative strand: Experiments, questionnaire, scales, tests, annual statistics etc.			
11. Outlined why this study is done and its implications			
12. Reported recommendations both for practitioners and researchers			
13. Ordered references systematically and consistently a. Kept appendices for outer reliability			

Level of Performance: All items must receive a YES or NA response. If any items receive a NO response, consult with your mentor to determine what additional activities you need to achieve competency in the weak area(s).

6. Conclusion

In this study, a learning package which provides the necessary knowledge and attitudinal information, and practice opportunities to developing a MMR manuscript based on SCID - systematic curriculum and instructional development- (Norton & Moser, 2013) is presented so that the learner would know why as well as when and how to perform the task of development for a MMR manuscript based on SCID.

In this learning guide, the most complex concepts, skills, and/or attitudes are made easy for every learner to understand, accept, and perform in developing a MMR manuscript. This learning guide suggests basic steps in developing a MMR manuscript for both academic staff and master/doctoral students in social sciences to follow. As the learner will self-practice the learning package he or she will understand to perform the task of developing a MMR manuscript effectively.

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Appendix

Appendix 1: *Duty/task: Systematic curriculum and instructional development for a mixed methods research*

	STEPS (Required to Perform the Task)		PERFORMANCE STANDARDS (Observable & Measurable Criteria)		TOOLS, EQUIPMENT, SUPPLIES & MATERIALS (Needed)		REQUIRED KNOWLEDGE AND SKILLS (Math, Science, & Language)		SAFETY (Concerns)
1	Determine the title of the manuscript	1	Determined title appropriate with the manuscript	1	Reference books, articles, dissertations	1	Master / PhD degree in the related field	1	N/A
2	Write the abstract and key words	2	Completed abstract and key words that reflected the content accurately	2	Database searching engine	2	Decision Making,	2	N/A
3	Review the literature	3	Defined the research problem clearly, tied to the relevant literature, up to date, completed with literature review with appropriate references	3	Text books, articles, dissertations	3	Knowledge of research problem in theory and philosophy of social sciences (the paradigm on which the method of the research is based),	3	Avoid palagrism
4	Explain the research aim and write research questions for both quantitative and qualitative strands of research	4	Determined research questions appropriate with research aim both quantitative and qualitative strands of research	4	Text books, articles, dissertations related to research aim and questions	4	Knowledge of how to state main and sub research questions for both quantitative and qualitative strands of research	4	N/A
5	Explain what mixed typed designs chosen	5	Selected mixed typed design consistent with the aim of the research	5	Reference books on mixed typed research methods	5	Knowledge of mixed typed research methodology	5	N/A
6	Explain sampling methods and techniques for both quantitative and qualitative strands of research	6	Explained sampling methodology, chose correct sampling size for both quantitative and qualitative strands of research	6	Reference books on research random and purposive sampling methods	6	Knowledge of random and purposive sampling methods and techniques for a research,	6	N/A
7	Explain data collection methods and techniques for both quantitative and qualitative strands of research	7	Explained data collection method through qualitative and qualitative forms and instruments	7	Reference books on both quantitative and qualitative research methods, surveys, scales, Voice recorder, Camera, Computers, Laptop, Software	7	Knowledge of using voice recorder and video, verbatim transcript, qualitative and statistical softwares	7	Ensure personal safety when travelling and at the research venue and ensure that someone you trust knows where **to you** go for data collection
8	Explain reliability and validity of the research for both quantitative and qualitative strands of research	8	Followed steps to ensure reliability and validity of the study for both quantitative and qualitative strands of research	8	Reference books on quantitative and qualitative research validity and reliability, qualitative data analysis and quantitative data analysis software	8	Knowledge of how to supply reliability and validity of the research for both quantitative and qualitative strands of research	8	Guarantee objectivity of measuring instruments, reliability and validity for both quantitative and qualitative strands of research, anonymity of the participants, obtain participants' written consent
9	Report ethical process for both quantitative and qualitative strands of research	9	Accurately reported ethical procedures (e.g. Avoided plagiarism, formal permissions,institutional Review Board (IRB) approval guaranteed anonymity of the participants, obtained participants' written consent)	9	Ethical regulations by the committee of the **institutions** you worked for, Plagiarism Detection Software	9	Using Plagiarism Detection Software to avoid plagiarism, preparing consent form for individual and focus group interviews	9	Keep data securely until destroyed
10	Analyze the data for both quantitative and qualitative strands of research	10	Organized data in terms of average scores in quantitative strand and categorically and chronologically, reviewed repeatedly and continually coded in qualitative strand by determining priority, timing, mixing and the level of interaction between the quantitative and qualitative strands either independently or interactively	10	Reference books on quantitative and qualitative research methods, questionnaires, scales, transcripts, qualitative softwares, statistical softwares	10	Knowledge of preparing questionnaires, scales, organizing experimental design, semi-structured preparing interview forms, observation forms and documents related to research topic, collecting and analyzing both artificial and real life documents	10	N/A
11	Discuss the findings for both quantitative and qualitative strands of research	11	Discussed findings using main topics according to how data are collected: experiments, questionnaires, scales and tests in quantitative strand and individual interviews, focus group interviews, observations and documents in qualitative strand.	11	Tests, questionnaires, scales in quantitative strand and transcripts, observation notes and documents in qualitative strand	11	Knowledge of using ICT (word, excel, adobe), using Data Analysis Software(quantitative or qualitative NVIVO, SPPSS) Analytical thinking, critical thinking	11	
12	Summarize and conclude	12	Outlined why this study is done and its implications	12	The results of whole manuscript	12	Analytical thinking, critical thinking	12	N/A
13	Report recommendations	13	Reported recommendations both for practitioners and researchers	13	The results of whole manuscript	13	Doing research with new ideas, taking charge of his or her ideas	13	N/A
14	Write references and add appendices	14	Ordered references systematically and consistently and kept appendices for outer reliability	14	Reference books, articles, dissertations and forms	14	Consistent and well organized	14	N/A

Appendix 2: *Duty/task: Systematic curriculum and instructional development for a mixed methods research (con't.)*

	WORKER BEHAVIORS (Important to Worker Success)		DECISIONS (Identify Decisions that Must be Made by the Worker)		CUES (Identify the Data Needed for Making Correct Decisions)		ERRORS (Indicate What May Result if Incorrect Decisions are Made)
1	Expert and professional	1	What is the correct and comprehensive title for the research?	1	Research aim	1	The title does not reflect the whole manuscript and does not make a sense
2	Goal driven	2	What and how many key words should I use to reflect the entire research?	2	Search data bases of research field	2	Key words do not reflect the whole manuscript and does not make a sense
3	Hard working, patient, dedicated to finish long-term projects, self-motivated	3	What reference books, articles, dissertations should I review? What scientific search engines should I use?	3	Review data bases of research field related to your research aim carefully to contribute the research field	3	Literature does not support your research aim and research questions. Readers do not understand why you do this research and what contribution you do to research field
4	Detail oriented, flexible, goal driven	4	What and how many research questions should I write for both quantitative and qualitative strands of research to reach the aim of the research?	4	Experience, review the literature related to research topic	4	The data you collected and your findings may not answer the research questions and keep you away from the research aim
5	Flexible	5	Which mixed typed design should I choose? Why?	5	Experience and reference book suggestions of mixed typed research methods	5	the design you choose does not comply with your research aim and you may mislead readers who are studying on it
6	Proactive	6	Which random and purposive sampling sampling methods and techniques should I choose? Why?	6	Experience and reference book suggestions of quantitative and qualitative research methods	6	The data you collected from the sampling do not support your aim and may mislead you
7	Cautious, punctual, good listener	7	How should I collect data? What materials should I use to collect data? How should I ensure my personal safety?	7	Experience, rely on both the results of objective data collection methods by focusing on measuring and the results of subjective data methods by focusing on the participants' thinking, supply triangulation	7	You lose both the objectivity of measuring instruments and your objectivity and thus the results may mislead others and your biases may mislead you
8	Trustworthy, professional, careful	8	What should I do to support reliability and validity of for both quantitative and qualitative strands of the research?	8	Do pilot study for reliability and validity of the study for both quantitative and qualitative strands	8	Your manuscript submitted to a journal can be rejected due to poor reliability and validity
9	Ethical Reliable, safety-oriented	9	What steps should I follow to conform to the ethics committee of social science researches?	9	Keep up with the steps in the ethical regulations form of the ethical committee and get ethical approval before doing your research	9	Bad reputation and you do your research in vain
10	Detail oriented, open-minded	10	Where and how should I mix the quantitative and qualitative strands while analyzing the findings? How should I code quantitative data in terms of numbers and qualitative data in terms of main themes and sub themes? Which quantitative analysis (t-test, anova, regression etc.) and qualitative analysis (thematic, descriptive, content) should I use?		Focus on scores as a result of experiments, scales and questionnaires in quantitative strand and participant views in transcript, participant observation notes and documents in qualitative strand Take interaction, timing, priority and mixing of qualitative and quantitative data into consideration while analyzing the findings?	10	You lose nomothetic characteristic of quantitative data or ideographic characteristic of qualitative data
11	Accurate and objective	11	Where and how should I mix the quantitative and qualitative strands while discussing the findings? Which findings should I take priority and discuss analytically?	11	Take interaction, timing, priority and mixing of qualitative and quantitative data into consideration while discussing the findings. Focus on which of your findings contribute to the research literature you are working on and what are the similarities and difference between your research and studies done so far	11	You cannot contribute to relevant research literature
12	Open minded	12	What significant conclusion should I write?	12	Focus on significant conclusion consistent with your findings?	12	Readers who has a quick look to review literature may have no idea on your research and do not cite your research
13	Adaptable	13	What recommendations should I put forward both for practitioners and researchers?	13	Suggest attractive and innovative recommendations consistent with your findings	13	Your published manuscript may not influence prospective researchers and you cannot lead them and you cannot be a familiar scientist in your own field
14	Accurate and careful	14	How should I organize references (number or alphabetical order? Which journal should I submit my manuscript?	14	Take care of author guidance of the journal you will submit for publication and its manuscript writing guidelines	14	Rejection of the manuscript by the reviewers and editors of a journal

Source: Duty/Task: SCID-MMR was developed by author Gunbayi based on DACUM and SCID trainings (Norton and Moser, 2007; Norton and Moser, 2013) on 14-18 September 2017 and July 23-27 2018 at CETE in Ohio State University.