
Objective of the study: The purpose of this study was to develop a model of organizational culture and effectiveness based on four traits of organizational culture; involvement, consistency, adaptability, and mission.

Tools used in the study: Two instruments were employed for the study.

1. The Self – report questionnaire which consisted of 65 statements covered four aspects of organizational culture i.e. and teacher collegiality. 55 value statements was used to determine the level of organizational culture. For a culture statements analysis, 750 teachers and 450 administrators were responded to all of the questions. The validity and reliability of the ten confirmed subscales of organizational a culture in the pilot study were as follows: Member identity (0.64), Group emphasis (0.63), People focus (0.43), Unit integration (0.66), Control (0.05), Risk tolerance (0.36), Reward criteria (0.55), conflict tolerance (0.56), Means- ends orientation (0.52) and Open system focus (0.62) with the reliability coefficients (alphas) provided in bracket.

2. The School Effectiveness Scale (SFS) which consisted of four scales was used to determine the level of school effectiveness. The SFQ defined their reliability alphas as follows: adaptation (0.41), Goal attainment (0.56), Integration (0.66) and latency (0.47). Teachers and administrators were asked to read the value statements and feeling items in 7point Likert scale.

Sample of the study: Sample of this study consisted of 595 teachers from 52 schools and 125 principals from the French-speaking community of Belgium.

Technique of analysis of data: The survey research method was used for the study. Teachers were responded a self-reported questionnaire dealing with the principal’s leadership and organizational culture. Hypotheses are tested using correlation, regression, and hierarchical regression analyses. The percentage, mean, standard deviation, ANOVA, Pearson’s product moment correlation Coefficient, and Multiple Regression analysis were employed in the analyses of the data.

Major Findings: The major findings of this study are as follow:

1. The mean scores of organizational culture and school effectiveness were at moderate level.
(2) There is a positive correlation between traits of organizational culture and the effectiveness measures. In general the correlation provides good support for the model of organization culture and effectiveness. The correlation successfully shows the impact of organizational culture traits on school effectiveness. All of the traits have the same range of impact on effectiveness except for control trait with a limited effect.

(3) The regression analysis revealed that there is a multiple correlation between organizational culture and school effectiveness.

(4) Some culture traits like group emphasis, unit integration, conflict tolerance and open system focus have better effect on subscales of effectiveness. For instance, correlation between group emphasis, unit integration, member identity, conflict tolerance and open system focus with integration is very high and respectively equal to 0.62, 0.62, 0.65, 0.63 and 0.65. Other characters have low correlation with all subscales, for example risk tolerance and control. Evidence reveal that when school more emphasis on the risk tolerance and control, the encounter to a lower effectiveness of the school and in contrast when emphasis more on the group emphasis, unit integration, member identity, and conflict.

STUDY 2: A Study of Relationship between School Culture and School Effectiveness
(Phuengthip Mangkang: 2000)

Objective of the study: The purpose of the study was to investigate the levels of school culture and school effectiveness and to compare the levels of school culture and its effectiveness as classified by school location and size. The study also finds out the relationship between the school culture and school effectiveness.

Tool used in the study: The five rating scale to measure the school culture and school effectiveness suggested by Patterson, et al, (1986) and Bennis (1971) were used for data collection.

Sample of the study: The sample of the study consisted of 314 secondary school teachers. The stratified random sampling technique was used for selection of sample.

Technique of analysis of data: In order to fulfill the objectives of this quantitative research, the study was focused on the relationship between school culture and school effectiveness. The percentage, mean, standard deviation, one-way analysis of variance (ANOVA), and simple correlation were employed in the analyses of the data.
**Major findings**: Results of the study were found as follow:

1. The level of school culture was rated at a high level, and when classified by size and school locations, statistically significant were found.

2. School effectiveness was also rated at high level, and again when classified by locations, significant statistical differences were found. However, when school effectiveness was classified by the size of the school, the statistical differences were found to be non-significant.

3. Each aspect of school culture i.e. school purpose, decision-making, sense of community, integrity, and diversity, showed statistical significant differences.

4. The school culture in each particular aspect was found to be positively correlated with the schools' effectiveness with statistical significance when classified by size and school location.

**STUDY 3**: The Effects of School Culture on the Role of Secondary School Principals. (Malee Khuan Khanueng, 2002)

**Objective of the study**: The purposes of the research were: (1) to study and compare the levels of school culture and practical roles and (2) to study the school culture which has effects on the practical roles.

**Tool used in the study**: The Patterson's questionnaire on school culture and the administrative standard on the practical roles of secondary school principals, suggested by Ministry of Education were used to be the tools for data collection.

**Sample of the study**: The sample of the study were 29 secondary school principals and 326 secondary school teachers. Stratified random sampling technique was used for selection of sample.

**Technique of analysis of data**: In order to fulfill the objectives of this quantitative research, the study was focused on the effects of school culture on the role of secondary school principals. The percentage, mean, standard deviation, ANOVA, Pearson's product moment correlation Coefficient, and Multiple Regression analysis were employed in the analyses of the data.

**Major findings**: Results of the study were found as follow:

1. The level of school culture in all secondary school sizes as a whole was at
the high level when considering individual aspects, it was found that other eight aspects were also at high which were: acceptance, authorization, being qualified, school goal, honesty, hospitality, personnel diversification respectively. Two aspects were at moderate level which were trustworthy and decision making respectively. It was found that the level of school culture in each size was different at non-statistical significance. After studying each aspect, it was found that the school culture in the area of goal of the big secondary schools was higher than that of the medium secondary schools. The principals and teachers in small secondary schools had a higher degree of being part of the school than those in the medium and big schools.

(2) The level of the practical roles of principals was at high in seven administrative aspects which were administration, disciplines, general administration, academics, services, school and community, and buildings and land area respectively. The level of practical roles of each size was at non-statistical significance. The practical roles in the area of general administration in big secondary schools were higher than those in medium ones. The services were higher in small secondary schools than the medium ones. In the area of school and community were higher in small secondary schools than the medium ones. The practical roles of buildings and land were higher in small secondary schools than the medium and big ones.

(3) The school culture does effect on the practical roles and could be written significantly in the multiple regression equation.

STUDY 4: School Culture and the Potential for Teacher Leadership Perceived by Principals and Teachers in New Jersey Elementary Schools. (Whelan, Nancy Brunner: 2002)

Objectives of the study: This study was to examine the school culture as perceived by principals and teachers and the potential for teacher leadership by means of the variables of gender, educational level, age, years with the school, socio-economic level of the school and the difference in the perceptions of teachers and principals.

Tool used in the study: The model is non-experiment quantitative research and uses the Organizational Culture Inventory Human Synergistic International to measure behaviour norms from the data gathered.
Sample of the study: The subjects in this study were teachers and principals from 23 elementary schools in New Jersey. The stratified random sampling technique was used for selection of sample.

Technique of analysis of data: The percentage, mean, standard deviation, and ANOVA test with a follow-up Tukey HSD post hoc was run for analysis of data. The statistical significance of this study is set at the p = < .05 level of confidence.

Major findings: The results of the study indicated as follow:

(1) There is no statistically significant difference between males’ and females’ perceptions of school culture.

(2) Level of education produced statistically significant difference with those participants holding a Masters Degree and above rating the school culture higher.

(3) The data suggested that age difference produced no statistically significant difference except in one behavioural.

(4) The results imply that those with the least and greatest experience rate the school culture significantly higher statistically than those with experience in the middle of the scale.

(5) The data on socio-economic level indicated that the lower socio-economic level districts rated the culture of the school significantly lowers statistically than those schools on a higher socio-economic level.

(6) The data set that compared principals’ and teachers’ perceptions of school culture, suggested that principals in the study rated the higher culture with the statistically significantly. Overall, the data indicated that principals and teachers, who participated in the study, rated the culture of the schools high in those behavioural norms where the potential for teacher leadership opportunity exists.

STUDY 5 : A Study of Organizational Culture and Effectiveness of Secondary Schools.

(Muhammad Arshad, 2003)¹⁸⁶

Objective of the study : There were three objectives in the study as follow:

(1) To determine the organizational culture of secondary schools.

(2) To study the organizational effectiveness of secondary schools

(3) To explore the relationship between organizational culture scores of
secondary schools and their effectiveness.

This study focused on in-depth understanding of organizational culture of secondary schools, its components and various related models along with the conceptual clarity of organizational effectiveness and their inter-relatedness. It further attempted to elaborate the relationship between the organizational culture and effectiveness in the secondary schools, the strategy of this study was to get input from school heads and teachers for identification of organizational culture, measurement of organizational effectiveness of schools and to explore their relationship.

**Tool used in the study**: Based on the descriptive survey method, data regarding attributes, situational factors, outcome based measurements of the effectiveness on the basis of student achievements from the last 3 years results of respective schools in the SSC examination, was collected through Demographic variable information Proforma (DVIP) administered to 170 secondary school heads (Five from each of 34 districts of Punjab). Two other research instruments i.e. organizational culture inventory and organizational effectiveness inventory (OCI & OEI) were administered to 160 school heads and 640 teachers (Four from each of 170 schools) for identification of identification of organizational culture and measuring organizational effectiveness of secondary schools respectively.

**Sample of the study**: The sample of the study were 160 secondary school administrators and 640 secondary school teachers selected from each of 34 districts of the Punjab. Stratified random sampling technique was used for selection of sample.

**Technique of analysis of data**: Two major research instruments were used in the study.

1. The Organizational culture inventory (OCI) developed by Cooke and Lafferty (1987)\(^{107}\) was used to determine the organizational culture of schools consisted of 120 Items.

2. The organizational effectiveness inventory (OEI) was used to measure the effectiveness of secondary schools composed of 28 items. This tool consisted of behaviours and outcomes like quality of service, coordination and adaptability, organizational mission, philosophy and values, duality of communication, standard of human resource management, appraisal and reinforcement, supervisory leadership, Job design and goals etc.
On the basis of the objectives of the study and research questions, 28 null hypotheses were formulated aiming at identifying the organizational cultures of schools and exploring relationship between the organizational culture of schools and their effectiveness scores. Pearson correlation, t-test, analysis of variance (ANOVA) and POST-HOC (LSD) test, were used to test the hypotheses of the study. All types of computation for the analysis of data were done by using Statistical Package for Social Sciences (SPSS) with the help of computer.

**Major findings** : On the basis of analysis of data for descriptive and inferential statistics, following findings were drawn for this study:

1. The key conclusions based on the descriptive and statistical evidences of the study indicated that adaptive culture and constructive culture styles were the most common culture styles of secondary school, which indicated that organizational culture of secondary schools, is quite conducive.

2. The results showed that attributional and situational factors in adaptive and unadaptive culture schools had almost no contribution on their effectiveness.

3. The schools having adaptive and unadaptive cultures differ significantly in their mean effectiveness with adaptive culture to have better mean effectiveness score. Likewise the secondary schools having Constructive culture style, Passive/ Defensive style and Aggressive/ Defensive styles, significantly differ on their mean effectiveness score, with Constructive culture style to be the most effective.

4. Results of the study further showed that all the twelve culture styles: Humanistic-encouraging Culture Style, affiliative culture style, approval culture style, conventional culture style, depended culture style, avoidance culture style, oppositional culture style, power culture style, competitive culture style, perfectionistic culture style achievement culture style and self-actualizing culture style, differ significantly on mean effectiveness score, with Humanistic-encouraging style, Affiliative culture, Self-actualizing culture style and Achievement culture style schools to be more effective.

5. It had been revealed from the results of the study that schools characterized with the values like setting realistic goals, establishing plans to reach set goals, serving clients with better services, orientation of member regarding their work, innovativeness, developing outstanding employees for high quality products, participation as person-centred
way, open communication, adaptability, well defined organizational mission, supervisory
leadership, coordination and sense of loyalty with work are the most effective.

(6) There was the relationship between adaptive culture score and effectiveness score respectively. Secondary schools with constructive cultural style and adaptive cultural style had been the most effective with effectiveness score.

(7) There was the relationship between un-adaptive culture score and effectiveness score with the statistically significant at 0.05alpha level.

(8) There was the relationship between schools having constructive culture style and their effectiveness score based on Pearson Product Moment Correlation was statistically significant at 0.05 alpha level.

(9) There was the relationship between schools having passive/defensive cultural style and their effectiveness score based on Pearson Product Moment Correlation was statistically significant at 0.05 alpha level.

(10) There was the relationship between schools having aggressive/defensive cultural style and their effectiveness score based on Pearson Product Moment Correlation was statistically significant at 0.05 alpha level.


Objectives of the study: The present research was designed to explore essential teacher competencies for school effectiveness and find out, if classroom teaching practices used in Workers Welfare Model Schools (WWMS) are consistent with these competencies. The objectives of this study were:

(1) To evaluate teacher competencies skills for school effectiveness
(2) To explore elements of school effectiveness
(3) To observe classroom environment and to assess teachers competence
(4) To suggest measures to enhance the school effectiveness in WWMS.

Tool used in the study: For this study, the official reports, documents and education policies of Government of Pakistan for information were used.

• Focused Group Discussion (FGDs) Principals: Twenty senior Principals’ of worker welfare model schools were contacted for focus group discussion with the permission
of the concerned authorities, when they were in Islamabad for official annual meeting. All participants were requested to assemble in Worker Welfare Fund (HQs) Islamabad when they came for the annual meeting. This timing was appropriate otherwise, it was not possible to get all participants assembled at one place. The discussion was completed in two sessions. During the first session, the participants were apprised of research purpose; general discussion to this context was held. In the second session, lead questions (Annex-A) were introduced and their point of view was recorded. It took about five hours to arrive at the conclusion. This was the exploratory phase of the study to identify and define the concept of school effectiveness.

- **Survey Questionnaire for Teachers:** The standardized questionnaire (developed by P.O. Nwaehutwu, 2006) was taken by the researcher and after discussion with participants of FGD and supervisor certain changes were incorporated in the standardized questionnaire keeping in view control environmental differences i.e. (1) Demographic and Professional Information, (2) Educational Competencies in Practice, (3) Professional Achievements Opinions. This questionnaire was adjusted / adapted to as the basic purpose of using the questionnaire to elicit information regarding standards of education taught and practiced.

- **Checklist for Classroom Observations:** Observations checklist was developed keeping in view the standards of effective classrooms. This research tool was to observe the actual delivery of lessons in classroom. Observations checklist is an effective tool of data collection.

25 interview questions were formulated for the principals. After the development of first draft, these tools were improved under the supervision of the advisor and two experts from the relevant field. The items were reduced to 12 interview questions for principals. The pre-testing was conducted on 03 principals. The tools were pre-tested to ensure the validity and reliability of research instruments. In the light of the feedback, some statements were deleted and some were modified. The final version of the tools was prepared in close consultation with the advisor.

**Sample of the study:** Sample of the study: Worker Welfare Fund is running 75 schools all over Pakistan. A sample of 40 schools was selected randomly. Multistage sampling technique was adopted to select the sample. Twenty (20) principals (for focused
group discussion), 400 teachers and 80 classrooms (for observations) constituted the population for this study.

**Technique of analysis of data:** Data collected through afore-mentioned instruments i.e. the questionnaire, classroom observation, focus group discussion and official documents was tabulated, analyzed by both qualitative and quantitative technique and interpreted category-wise. To analyze the data, chi-square test was applied to find out the significance of difference among the opinions of the respondents. On the basis of results obtained from the analysis of data through chi-square test, statements were accepted or rejected.

Data collected was analyzed quantitatively as well as qualitatively. As data was collected through multiple sources, the technique of triangulation was adopted to analyze the data from various standpoints, to place the findings in right perspective. Descriptive statistical tools were also applied in data analysis.

Data collected through questionnaire, was analyzed at three levels. General Information regarding principals and teachers was presented in the form of tables. The questionnaires was analyzed by taking frequency occurrence and percentages at three point scale.

The points of FGDs were analyzed qualitatively. Data collected from the teacher was analyzed on three points rating scale the data collected from techniques and ranking method to get results. Similarly data collected through questionnaire on three point scale was also analyzed qualitatively.

Data collected through questionnaire was tabulated and analyzed through statistical treatment Chi-square test ($\chi^2$). It is a non-parametric test of significance, appropriate when the data is in the form of frequency counts. It compares proportions actually observed in a study with proportions expected to see if they are significantly different. This test was applied to the responses of teachers of Workers Welfare Model Schools.

From the score of rating scale, percentages and mean score was also calculated. Qualitative analysis of FGDs were also presented at the end of the analysis.

**Major findings:** The results of the study indicated that through most of the teachers are aware of standards of teaching for school effectiveness to some extent but they
are not implementing these standards in their classrooms. Also majority of the teachers are not using evaluation techniques properly. The teachers, however, agreed with two major characteristics of the teacher education for school effectiveness i.e. content knowledge and pedagogical competencies. The major implication of the study is to shift from lecture paradigm to collaborative, interactive and democratic teaching style and develop mentoring as well as monitoring teacher education programme for overall school effectiveness. Also a need emerges to find out as to why teachers, despite having knowledge of the required techniques, do not follow the standards of school effectiveness.

STUDY 7: A Regression Analysis of the Relationship between Organizational Culture and Effectiveness of Principal of Secondary Schools (Yadollah Mehralizadeh: 2006)

Objectives of the study: The objective of the study was to explore the relationship between organization culture and effectiveness of principal of secondary schools of Lorestan State in Islamic Republic of Iran.

Tools used in the study: Two instruments were developed for the study. One was the tool to measure organizational culture and the other one was the tool to measure principal’s effectiveness.

Sample of the study: The sample of the study was 800 teachers and 300 principals of the secondary school in province of Lorestan.

Technique of analysis of data: This study was the survey research method, based on the culture theory of Robbins and effectiveness theory of Parsons. The data were analyzed via Pearson correlation and Regression analysis (Stepwise method).

Major Findings: The major findings showed that:

(1) There was a positive correlation between organization culture and principal effectiveness.

(2) The regression analysis revealed that there was a multiple correlation between organization culture and principal effectiveness.

(3) Based on stepwise method subscales such as: conflict, transparency, communication, supportive and reward system predicted about 0.85 of total variances of principal effectiveness in Lorestan state.
STUDY 8: A Study of School Effectiveness in relation to Organizational Culture (Mawin Senge: 2006)

Objectives of the study: The purposes of this study were:

1. To determine the level of organizational culture of secondary school
2. To determine the level of secondary school effectiveness
3. To study the relationship between the score of school effectiveness and organizational culture of secondary schools.

Tools used in the study: Two instruments were employed for the study.

1. The Organizational Culture Inventory (OCI) which consisted of 55 value statements was used to determine the level of organizational culture. For a culture statements analysis, 750 teachers and 450 administrators were responded to all of the questions. The validity and reliability of the ten confirmed subscales of organizational culture in the pilot study were as follows: Member identity (0.64), Group emphasis (0.63), People focus (0.43), Unit integration (0.66), Control (0.05), Risk tolerance (0.36), Reward criteria (0.55), conflict tolerance (0.56), Means-ends orientation (0.52) and Open system focus (0.62) with the reliability coefficients (alphas) provided in bracket.

2. The School Effectiveness Scale (SFS) which consisted of four scales was used to determine the level of school effectiveness. The SFQ defined their reliability alphas as follows: adaptation (0.41), Goal attainment (0.56), Integration (0.66) and latency (0.47). Teachers and administrators were asked to read the value statements and feeling items in 7-point Likert scale.

Sample of the study: The sample of the study was 750 teachers and 450 administrators of secondary school in the Central Part of Thailand.

Technique of analysis of data: The survey research method was used for the study. Ten traits of an organization’s culture i.e. Member identity, Group emphasis, People focus, unit integration, control, risk tolerance, reward criteria, conflict tolerance, means-ends orientation and open system focus were used to determine the level of organizational culture and four subscales (adaptation, goal attainment, integration and latency) were used to determine the school effectiveness. Each subscales are divided into some multiple indicators i.e. Goal attainment Achievement, Quality, Resource acquisition, Efficiency, Integration Satisfaction, Climate, Communication, Conflict, Latency, Loyalty, Central life interest,
Motivation, Identity. The data were analyzed to find out mean, standard deviation, correlation and Regression analysis (Stepwise method).

**Major Findings:** The major findings showed that:

1. The mean scores of organizational culture and school effectiveness were at moderate level.

2. There was a positive correlation between traits of organizational culture and the effectiveness measures. In general the correlation provides good support for the model of organization culture and effectiveness. The correlation successfully shows the impact of organizational culture traits on school effectiveness. All of the traits have the same range of impact on effectiveness except for control trait with a limited effect.

3. The regression analysis revealed that there was a multiple correlation between organizational culture and school effectiveness.

4. Some culture traits like group emphasis, unit integration, conflict tolerance and open system focus have better effect on subscales of effectiveness. For instance, correlation between group emphasis, unit integration, member identity, conflict tolerance and open system focus with integration is very high and respectively equal to 0.62, 0.62, 0.65, 0.63 and 0.65. Other characters have low correlation with all subscales, for example risk tolerance and control. Evidence reveal that when school more emphasis on the risk tolerance and control, the encounter to a lower effectiveness of the school and in contrast when emphasis more on the group emphasis, unit integration, member identity, conflict tolerance and open system focus a high effectiveness of school observed.

**STUDY 9: The Relationship between Leadership Practices and Organizational Culture: An Education Management Perspective** (Rita Niemann: 2006)

**Objectives of the study:** The purpose of this study was mainly to determine whether a correlation existed between the two variables i.e. school leadership practices and organizational culture in schools, before the interrelatedness between possible subgroups would be probed in follow-up studies. This investigation culminated in a grounding perspective on leadership and organizational leadership practices culture and a correlation profile of the relationship between the cultures of particular schools and their leadership in order to serve as a guideline for a possible model for matching applicants, with
particular leadership qualities, to schools where the sound organizational culture has broken down.

**Tool used in the study:** The interrelatedness between organizational culture and leadership was particularized by means of appropriate measuring instruments. In order to reveal possible correlations, the following measurement instruments were used:

- The Leadership Practices Inventory (LPI) of Kouzes and Posner (1993) which measures leadership practices and reveals the leader’s behaviour concerning challenging processes, leadership practices 613 inspiring a shared vision, enabling others to act, modeling the way and encouraging the heart of others.

**Challenging the process** refers to leadership dimensions such as: searching out opportunities, willingness to take risks, innovativeness, treating mistakes as learning opportunities, staying up-to-date, and revealing an experimenting attitude.

**Inspiring a shared vision** refers to leadership dimensions such as: gazing across the horizons of time, enlisting the emotions of others to share the vision by means of their enthusiasm, and showing others how mutual interest can be met through commitment to a common purpose.

**Enabling others to act** refers to leadership dimensions such as: strengthening others, fostering collaboration, building relationships of mutual trust, stressing cooperative goals, and making others feel important, strong and influential.

**Modeling the way** refers to leadership dimensions such as: clarity about their organization’s values and beliefs, keeping projects on course, behaving in a way that is consistent with the existing values, making it easy for others to achieve the goals by focusing on key priorities, breaking down big projects into achievable steps (small wins), and setting an example.

**Encouraging the heart** refers to leadership dimensions such as: giving recognition and encouragement to those who persist, assisting others to climb the steep and arduous, continuing to pursue the vision, and celebrating accomplishments.

- Goffee and Jones’s Organizational Culture Questionnaire (1996) explores sociability and solidarity as two dimensions of organizational culture, to reveal the prevailing culture of an organization. The developers of this questionnaire point out that, although these two categories may at first seem not to capture the whole range of human behaviours, they
The Organizational Culture Questionnaire consists of 14 items, rated as low, medium or high, to which a quantitative rating scale is attached. The questions focus on the two fundamental dimensions of organizational culture, namely, sociability and solidarity. Sociability is the measure of emotional, non-instrumental relations among individuals and portrays such as: friendship that is valued for its own sake, social interaction through continuing face-to-face relations, continual relation building, morale and esprit de corps, teamwork and sharing of information, and freedom to express and accept new ways of thinking.

Solidarity is based not so much in the heart as in the mind and portrays such as: dimensions that originate in the mind such as common tasks and goals that will benefit all involved parties, mutual interests, the group’s will to take actions to address poor performance, shared organizational standards, the collective will to succeed, and the mutual pursuit to perform optimally.

The reliability of the two instruments was determined using the alpha coefficients. The Cronbach alpha coefficients were uniformly high on the data accumulated for this project, revealing a reliability coefficient of 0.99 for the LPI and 0.83 for the Organizational Culture. The validity of both the instruments used lay in the fact that both questionnaires had been standardized; the questions in the questionnaire portrayed ‘real-life’ situations, which was a positive attribute of content validity and leadership practices, the items measured were related to the kind of statements participants generally made about their own and other’s experiences of best practices (in this case with regard to leadership and organizational culture), thus contributing to the construct validity of the instruments.

Sample of the study: Five Leadership Practice Inventory (LPI) and five Organizational Culture Questionnaires (OCQ) were distributed in 30 schools: one questionnaire to the principal and four to purposively selected staff members at the same school, who were able to participate in a sensible manner. Questionnaires were received from all 30 schools involved. The LPI and the OCQ were completed by 29 principals as well as by four subordinates from each of the 30 schools. Only one principal (school 4) refused to participate (in the latter case the average of the responses of the four staff members was calculated and used in the analysis). This exercise resulted in the return of 149 questionnaires to be analyzed according to the various leadership practices (challenge the
process, inspire a shared vision, enable others to act, model the way to subordinates and encourage the heart) and the schools' culture (sociability and solidarity). Although the sample was relatively small in comparison to the population of principals in the Free State, which constitutes a principal body of 2841 principals.

**Technique of analysis of data:** Each school's data had to be analyzed and kept together as it was necessary to determine what the correlation was between the particular organizational culture and the particular leadership practices. The raw data obtained from the five questionnaires from each of the 30 schools in the Free State Province (only four from school 4) were used to calculate the mean scores and standard deviations for each of the leadership dimensions as well as for each of the organizational culture dimensions. The mean scores for the five leadership dimensions were calculated out of 30, and the means of the organizational culture dimensions (sociability and solidarity) out of 20. The arithmetic means on the respective leadership and cultural dimensions obtained from each school were entered into the STATA data processing program to compute the correlations ($r$) between the variables. Linear regressions and regression fit graphs were used to analyze the data obtained from the investigation. To indicate correlations, regressions were regarded as valuable instruments as they portrayed the relationship between variables, where $r$ was calculated as follows: Scatter plots resulting from regression analyses visually illustrate the particular relationships. The principals' leadership dimensions (sub-variables) were used as the independent variables in this study and the school culture dimensions (sub-variables) as dependent variables.

**Major findings:** It was found from the study that there was the positive relationship between the principals' leadership practices and the sociability and solidarity dimensions of their school cultures emerged from this study. Each of the five leadership practices: challenging the process, inspiring a shared vision, enabling others to act, modeling the way and encouraging the heart, influenced the school culture and were in some way related to either sociability or to solidarity. These findings necessitated the rejection of the null hypothesis. Rejection of the null hypothesis implied that there was reasonable proof to believe there was a significant relation between some of the basic leadership practices of the principal and the establishment of the basic dimensions of a positive school culture that would probably be conducive to teaching and learning. A school's culture forms a great
deal of the staff’s perceptions of their school and their commitment to their work. It was also indicated that an organizational culture was cultivated by management and, therefore, it would be a true asset to a school if a suitable principal could be appointed: a principal who leads in such a way that a culture, in which teaching and learning could thrive, is established.

STUDY 10: Models of Change and the Impact on Organizational Culture (Darlene, Y. Motley: 2007)

Objectives of the study: This study examined the construct of change and the impact change has on the organizational culture within secondary school and examined perceptions and attitudes of staff toward the change process and the organizational culture.

The study was to explore the construct of change management on the impact of organizational culture, specifically investigating the impact of use of the Sanctuary Model as an organizational model of change.

Tool used in the study: Participants completed a self-report measure which incorporated measures of organizational culture and attitudes toward change. The survey was compiled from existing measurement tools. The independent variable of attitude toward change was measured using an 18-item, five point Likert scale questionnaire developed by Dunham, et al, 1989. The dependent variable of culture was measured using the Denison Organizational Culture Survey (DOCS) which consisted of a 60-item, five point Likert scale questionnaire (Denison, 2005). Additionally, personal and demographic data relating to age, gender, marital status, educational background, income, position within the school, and length of employment with the organization were obtained. Cronbach alphas for the new constructs ranged from 0.82 to 0.95, a very strong reliability.

Sample of the study: Participants were identified from five different secondary schools that have experienced significant change in the past several years. Three schools are currently using the Sanctuary Model and two schools are not. The schools who participated in the study and who subscribe to The Sanctuary Model consist of a residential treatment facility for children and adolescents in New York, an Approved Private School for emotionally disturbed children in Pennsylvania, and a drug and alcohol treatment programme in Oklahoma. The schools who participated in the study as part of the test group and who do
not subscribe to The Sanctuary Model include two different mental health residential treatment programmes located in Pennsylvania.

The control group (non-Sanctuary schools) responses totaled 144 or 60% of the respondents. The test group (Sanctuary schools) responses totaled 96 or 40% of the respondents in the study.

**Technique of analysis of data:** Data analysis consisted primarily of descriptive statistics procedures and some inferential assessment. Descriptive statistical analysis was utilized to present the primary characteristics of the sample. This included frequencies and percentages. The alpha coefficients for each of the subscales were analyzed. Further analysis involved calculation of means, standard deviations and inter-correlations of variables. Inferential statistics were employed to examine differences between the Sanctuary and non-Sanctuary agencies. An independent t-test was conducted in addition to an analysis of variance in order to examine significance between the two model types.

**Major findings:** Co-relational analysis indicated strong relationships between change, culture, and organizational performance. A t-test analysis showed the mean levels of Sanctuary respondents were higher on every subscale of the measures than non-Sanctuary respondents. There was a significant positive difference in the strength of culture in the agencies who subscribe to The Sanctuary Model than those organizations that do not employ that same model. Additionally, the attitude toward change for the test group (Sanctuary), while not statistically significant, was more positive than that of the control group (Non-Sanctuary). The ANOVA was conducted to assess the model of change and the impact of culture and attitudes toward change. This indicated that both culture and attitude towards change in the test organizations were significant at level of < 0.01, thereby supporting the significance in difference between the test group and control group of this study. Additional details of the findings are available by contacting the author.

In conclusion, this study provided an opportunity to test the Sanctuary Model as a viable model of organizational change. Within the non-profit sector, and especially in mental health and social services, change is a constant factor. With shifts in funding, legislation, and the increasing demands of our population who require community supports, it is critical for these types of organizations to develop strategic means to manage and efficiently respond to
the continuous changes. This study’s findings provide additional support for the Sanctuary Model as a potential change model within the school.

**STUDY 11: An Exploration of the Impact of Principal Leadership Behaviour on Organizational Culture (Nicholas P. Numkanisom : 2007)**

**Objectives of the study:** The purposes of this study were:

1. To describe quantitatively the leadership behaviour of principals and organizational culture in the 12 schools of the Brothers of St. Gabriel, in Thailand
2. To identify the pattern of leadership behaviour of the principal in the selected school which possesses the highest significant scores on both the transformational leadership behaviour of the principal and organizational culture using ranking as a basis for selection

**Tools used in the study:** Two tools were used in the study:

1. The Multifactor Leadership Questionnaire- the MLQ developed by Bass and Avolio (1997) was used to measure the leadership styles of the principals.
2. The Patterns of Adaptive Learning Survey, developed by Maehr and Midgley (1996) was used to measure the dimensions of organizational culture.

**Sample of the study:** There were 1,582 teachers from 12 schools to be the sample of the study. This research adopted census sampling. Teachers from the sample school were chosen by random simple sampling in their schools. The sample in each school was calculated using Yamane’s method.

**Technique of analysis of data:** The percentage, mean, standard deviation, ANOVA, Pearson’s product moment correlation Coefficient, and Multiple Regression analysis were employed in the analyses of the data.

**Major findings:** The quantitative findings provided descriptive evidence that transformational leadership existed in the schools of the Brothers of St. Gabriel, in Thailand and the dominant culture of the schools was Professional Development. In addition, the findings also revealed that there was a significant relationship between leadership behaviour and school culture. In the second phase, the leadership behaviour of the selected principal was interpreted based on transformational leadership applied in a school setting. This process was outlined by Leithwood (1996) as frame of reference to identify a pattern of leadership
behaviour of the selected principal. The findings revealed that the selected principal exercised the qualities of transformational leadership to some extent. Some qualities were missing and some were practiced to a moderate degree. The study helps provide guidance and direction to principals who wish to exercise their leadership in a more appropriate and relevant way particularly in a context of change.


Objectives of the study: The purposes of the study were to focus on the synthesis of current and key characteristics of School Effectiveness as well as a current definition of an effective school in the context of National secondary schools from the perception of principals. Therefore the aims of this research are:

1. to synthesize current and key characteristics of school effectiveness from the perspective of principals, heads of department and teachers of national secondary schools in Kuala Lumpur, Malaysia
2. to triangulate the findings by interviews in two selected schools.
3. to identify the keywords or descriptors used in defining an effective school to synthesize a definition based on the keywords identified in the research.

Tool used in the study: The tools used in this study were questionnaire and interviews. The questionnaire had nine items, with an open-ended question that requested a list of keywords to define an effective school and a part open-ended section that requested further suggestions for characteristics of school effectiveness. For interviews, two schools were selected at random from the 36 schools that responded to the questionnaire. The interviews were semi-structured and with an interview guide.

Sample of the study: This research is focused on national secondary schools in Kuala Lumpur. In Kuala Lumpur there are 95 national secondary schools, nine private secondary schools and four private Chinese secondary schools (School malaysia, 2008). As the majority of secondary schools in Kuala Lumpur (88%), are national secondary schools, it is meaningful to carry out the research in national secondary schools. The sample of this study consisted of 120 respondents consisting principals, Heads of Department and teachers
from 40 national secondary schools in Kuala Lumpur. The selection was by random stratified sampling with pre-set criteria.

**Technique of analysis of data:** The descriptive and comparative statistics was used in data analysis.

Current characteristics of school effectiveness was synthesized from responses to listed characteristics that emerged from the current literature review in Malaysia with a scaled score of 1 till 5 delegated as least to most important.

Key Characteristics listed the questionnaire had 14 characteristics which were synthesized from literature review local and abroad- nine had commonality and five were government policy issues.

**Major findings:** The results of this study indicated that:

1. The five current characteristics selected were effective teaching and learning, principals’ leadership skills, student self-discipline, good behaviour among students and greater cooperation between principal and teacher and among teachers.

2. Five main qualities of an effective principal were also synthesized. The five key characteristics of school effectiveness selected are: A principal who is strong, professional and involved; effective teaching and learning; greater cooperation between principal and teacher and among teachers; greater collegiality between principal and teacher and among teachers and effective parental involvement.

3. 22 additional characteristics of school effectiveness were suggested. They were: principal factors (5), school factors (8), teachers factors (7), student factors (1), and other factor (1). The details of 22 additional characteristics of school effectiveness are as follow:

**Principal Factors:**

(i) A principal who does not talk behind the back

(ii) Does not practice any form of discrimination

(iii) Values teachers’ contributions

(iv) Able to accept constructive criticism from teachers

(v) Able to know the strengths and weaknesses of staff and hence make a fair judgment in appraisals
School Factors:

(i) Competent Human Resource Management
(ii) Networking between schools
(iii) Respect and understanding among staff of all categories
(iv) Having a school canteen that is tidy, hygienic and with food sold at affordable prices
(v) Efficient financial clerks
(vi) An administration that has concern for the welfare of teachers
(vii) Having a sufficient number of experienced teachers
(viii) Having effective Senior Assistants and Heads of Department

Teacher Factors:

(i) Provision of financial aid in ICT for teachers and students
(ii) Serving as good role models for students
(iii) Teachers focusing on life-long and self-directed learning
(iv) Possessing a good personality and self-respect.
(v) A focus on enrichment activities in teaching and learning
(vi) Intellectualism among teachers
(vii) Should be agents of change by being creative and innovative

Student Factors:

(i) Have a vision, clear ambition and purpose to acquire knowledge

Others:

(i) Involvement of other Government agencies and NGO’s.

(4) The definition of an effective school synthesized in this research had one descriptor in line with the NPI and other descriptors in line with the selected current and key characteristics of school effectiveness.

(5) Records with the FIS indicated that currently majority of the national secondary schools in Kuala Lumpur were effective.

(6) The interview with the respondents from two schools indicated that their item responses had a significant (\(p<0.05\)) convergent validity, test-retest and parallel-form reliability in responses and that the definition of an effective school synthesized was reliable.
STUDY 13: A study of Principals in Schools with Positive Organizational Culture
(Nadine Engels and other: 2008)

Objectives of the study: The purposes of this study were: (1) To study the relationship between organizational culture as perceived by teachers and principals' functioning, well-being and its antecedents, (2) To test the significant differences between the mean scores of principals' functioning, well-being and its antecedents belonging to different size of school having different scores of organizational culture, and (3) To discover the patterns in the profiles of principals within remarkably positive organizational cultures.

Tools used in the study: There were two tools used in the study:

(1) The questionnaire for the principals consisted of four parts: (1) well-being indicators, from a positive perspective as well as from a negative perspective: job satisfaction, job enthusiasm and burnout; (2) personality characteristics: Type A behaviour, locus of control, general self-efficacy; (3) decision-making style; and (4) school system, province, school type, gender and age.

In order to triangulate the data gathered through the questionnaires and to obtain a more complete picture, each of the principal was interviewed. Semi-structured interviews were used. The length of the interviews was between 90 minutes and 2 hours. The topics covered in the interviews were: (1) school characteristics; (2) previous training and perception of efficacy as a principal; (3) preferred and emphasized task components, leadership competences, decision-making and time management; (4) development of shared norms, values, goals; participative decision-making; and (5) support from team, colleagues, school board, education authorities and government.

(2) The questionnaire on organizational culture for teachers consisted of the aspects of the goal oriented (i.e. participation in decision making, innovativeness, cooperation between teachers) and the well-being team.

A mixed-method design was used in the study. Data were collected in three stages. First, the principals were sent a questionnaire. Two or three weeks later, the researchers went to the school to collect the questionnaire and to interview the principal. During a second visit to the school, they administered a questionnaire on well-being and organizational culture among the teachers.
Sample of the study: A total of 52 principals and 700 teachers of primary schools were the representative sample with respect to school system, province, school type, gender and age.

Technique of analysis of data: For the analysis of data, as the sample size was moderate, statistics were used for the analyses of the quantitative data. The ratio of sample size to independent variables was below 5 to 1, which is too low to use multivariate techniques such as regression analysis. Correlations between school culture and teacher well-being variables, on the one hand, and principal personality, well-being and decision-making variables, on the other hand, are calculated. Then, to be able to compare school teams with low, average and high scores on school culture and well-being measures, and in order to better integrate the qualitative and quantitative data, we transform the scores on the teachers' school culture and well-being scales into standardized $z$-scores in order to distinguish high (+ 1 SD mean), average and low groups (- 1 SD mean) for each of these scales. The results on the principals' questionnaires are then compared between the three groups, using the Kruskal-Wallis test. It is important to mention that school culture and teacher well-being scores for each school are based on the aggregated scores of individual teacher responses. Therefore we verified the consensus among teachers within schools, using Lindell's $R_{wg}$ for assessing within group agreement. This index compares the variability of a variable within a specific unit to an expected variance. The aggregation for all school culture and well-being scales is acceptable, the $R_{wg}$ exceeding 0.70.

The interviews were audio taped and transcribed. A coding list was developed, based upon the conceptual framework. The qualitative data were then analyzed with the software package for coding, grouping (and thus reducing the large amounts of data), and for displaying relationships within and between cases. In order to improve the reliability of the analyses, five interviews were coded separately by two coders. In a cross-case analysis the qualitative data of schools with high and low scores on school culture and well-being measures were compared. In order to describe patterns in the profiles of principals within remarkably positive school cultures and their opposites the quantitative data was used.

Major findings: The results of the study were as follow:

(1) There was the significant relationship between organizational culture as perceived by teachers and principals' functioning, well-being and its antecedents.
(2) There was the significant difference between the mean scores of principals’ functioning, well-being and its antecedents belonging to different size of school having different scores of organizational culture.

(3) In order to discover the patterns in the profiles of principals within remarkably positive organizational cultures, it was found that the schools with very positive organizational cultures, the principals also found high achievement orientation. They focus on creating a flexible, stimulating, participative and supportive environment, do not only identify with roles of mentor or innovator but manage to devote most of their time to their preferred role. Most of them are satisfied with their jobs.

STUDY 14 : Teachers Job Satisfaction and Motivation for School Effectiveness: An Assessment (Nwachukwu Prince Ololube.: 2009)

Objective of the study : The purpose of this study was to assess the difference and relationship between the level of teachers’ job satisfaction, motivation and their teaching performance in Rivers State of Nigeria.

Tool used in the study : The research instrument titled “Teachers’ job Satisfaction and Motivation Questionnaire” (TEJOSAMOQ) was used to gather data for the study. Section “A” of the research questionnaire describes respondents’ background information, categories include: gender, age, status, area of specialization, education level, and length of service. Section “B1 and B2”, on the other hand describes possible job satisfaction and dissatisfaction variables. The questionnaire was made up of 6 items in section ‘A’ and 12 items in section ‘B1’. Respondents were asked to rank some possible items on job related sources of satisfaction and motivation from the most important 1, 2, 3… to the least important 10, 11 and 12. Section ‘B2’ contains 17 items of job related sources of dissatisfaction and was constructed along a four-point likert-type scale (summated) of not dissatisfied (1), not so dissatisfied (2), dissatisfied (3), and strongly dissatisfied (4). A summated rating scale, one type of which is called likert-type scale, is a set of attitude items all of which are considered of approximately equal “attitude value” and to each of which subjects respond with degree of satisfaction and dissatisfaction (intensity). A reliability measurement was seen as suitable in this investigation. In the analysis, using the SPSS version 13.0 software programme, a Cronbach alpha reliability of 0.89 was obtained which shows that the research instrument had
a strong reliability. The face and content validity of the research instrument were ascertained by some experts in Test and Measurement.

Sample of the study: The research area was Rivers State and the population of the study consisted of all the teachers in Rivers State (accessible) of Nigeria (target). The Rivers State is home to 146 public secondary schools, which are different in size and type. The population is comprised of principals and teachers from 18 randomly selected secondary schools that have teaching staff strength of more than 50 each. A convenient sample size of 680 participants who were also randomly selected was chosen from amongst the respondents.

Technique of analysis of data: A survey research design was used in this study to investigate job satisfaction and motivation of secondary school teachers in Nigeria. The thematic foundation of this research study rests on the need-based approach or content theory of motivation. To this end, questions in the questionnaire followed in many ways and themes the classic works of Maslow (1970) and Herzberg et al. (1959) and other content theory scholars. The need satisfaction variables were divided into five areas based on Maslow's categorization. They were physiological needs, security needs, social needs, self-esteem needs and self-actualization needs. Herzberg et al. also influenced this study. They categorized man's work needs as follows: achievement, advancement, responsibility, recognition and work itself; they called them 'the motivating factors' whereas the hygiene factors are pay/salary, job security, working conditions, policy and administration, supervision and interpersonal relationships. These areas of needs formed the components of needs satisfaction in this study.

To arrive at the intended analyses, the participants’ responses were keyed into SPSS version 13.0 software and several sets of statistical analyses were performed: mean point value, standard deviation, variance and t-test of significance. One-way-analysis of variance (ANOVA) was employed to test the relationship between variables and respondents’ background information. The t-test of significance was computed to test for statistically significant differences in the variables. A statistically significant set at p < 0.05 assesses if the researcher’s level of confidence in the sample also exists in the population.

Major findings: Findings from this study revealed that teacher related sources of job satisfaction seem to have a greater impact on teaching performance, as teachers are also
dissatisfied with the educational policies and administration, pay and fringe benefits, material rewards and advancement. The results of the study suggested that job satisfaction and motivation are very essential to the continuing growth of educational systems and they rank alongside professional knowledge and skills, center competencies, educational resources as well as strategies, in genuinely determining educational success and performance.

STUDY 15: A study of School Culture, Leadership, Teacher Quality and Student Outcomes via a Performance Framework in Elementary Schools Participating in a School Reform Initiative (Matthew Ohison, 2009)

Objectives of the study: The purpose of this study was to examine the relationships among teacher quality characteristics and school culture components and their influence upon student attendance and suspension rates. In addition, the research also examined the educational leadership practices of exemplary school principals in relation to the components of a collaborative school culture.

Tool used in the study: School culture surveys were administered to examine six components of collaborative culture identified as collaborative leadership, teacher collaboration, unity of purpose, professional development, collegial support, and learning partnership. Using the school as the unit of analysis, data were also collected examining student absences and suspensions as well as teacher input characteristics such as years teaching, percentage out of field, advanced degrees, and certification as reported by the Florida Department of Education’s School Indicators Report. Finally, interviews were conducted to examine the strategies and practices utilized by exemplar school principals to augment the data and better inform practice.

Sample of the study: The sample included 50 elementary schools in the state of Florida. Schools were selected based upon their partnership with the University of Florida and the Lastinger Center for Learning. The basis for the research was grounded in the educational performance framework of inputs and processes influencing outcomes.

Technique of analysis of data: Using multiple regression and Pearson correlations, the data were examined to determine the nature of the relationship between school outputs, processes and inputs. Three research questions, six null hypotheses, and
one open-ended question was introduced to examine the correlational and predictive associations amongst the variables.

**Major findings:** The findings revealed that as teacher collaboration increased, the model predicted that student suspensions would decrease by 6.709%. In addition, the model predicted that when the percentage of out-of-field teachers within a school increased, student suspensions would decrease by 0.16%. Finally, as the percentage of non-certified teachers within a school increased, the student suspension percentage increased by .22%. The exemplar interviews revealed comprehensive discussions regarding components of a collaborative school culture and educational leadership practices.

**STUDY 16: The Impact of School Culture, Teacher Job Satisfaction, and Student Attendance Rates on Academic Achievement of Middle School Students** (Hatchett, Diane Yvonne, 2010)

**Objectives of the study:** The purpose of this study was to examine the relationships among school culture, teacher job satisfaction, and student attendance rates on academic achievement of middle school students.

**Tool used in the study:** The followings are the tools used in the study: (a) school culture as measured by the School Culture Triage Survey combined scores, (b) job satisfaction of teachers as measured by the Minnesota Job Satisfaction Questionnaire (MSQ) scores, (c) student achievement scores as measured by the Commonwealth Assessment Testing Score (CATS) accountability index for each school, and (d) student attendance rates.

**Sample of the study:** This quantitative study focused on 760 Kentucky middle school teachers in 28 school districts across the state of Kentucky.

**Technique of analysis of data:** This study utilized correlation analysis and multiple regression to answer the research questions. The research questions were (i) Is there a relationship between School Culture Triage Survey scores and Minnesota Satisfaction Questionnaire-Short Form scores? (ii) Is there a relationship between School Culture Triage Survey scores and Commonwealth Accountability Testing scores? (iii) Is there a relationship between the Minnesota Satisfaction Questionnaire-Short Form scores and the Commonwealth Accountability Testing scores? (iv) Is there a relationship between attendance and Commonwealth Accountability Testing scores? (v) Is there a relationship between School
Culture Triage Survey scores and attendance rates? and (f) Is there a relationship between Minnesota Satisfaction Questionnaire-Short Form scores and attendance?

**Major findings**: The results of the Pearson $r$ showed that there was a positive correlation between the SCTS and MSQ scores, the variables of the School Culture Triage Survey scores and the Commonwealth Accountability Testing scores, as well as, a positive relationship between attendance and CATS. No other positive correlations were found.

Notably, in Model 1 of a multiple regression analysis, School Culture Triage Scores were a significant predictor of CATS scores. However, once attendance and teacher job satisfaction scores were added in Model 2 of the regression analysis, the researcher determined that the relationship between School Culture Triage Scores and CATS were spurious at best. The only variable which maintained a significant positive relationship was attendance. The present study seeks to contribute to the field and address gaps in the literature at the middle school level. Teacher job satisfaction was not a significant predictor of student achievement.

2.5 Summary

The second chapter discussed about the school effectiveness and school culture. School effectiveness is defined as the school accomplishes its objectives. There are ten factors included in the school effectiveness based on the suggestion of Sammons, et al, 1995). They are: professional leadership, shared vision and goals, learning environment, concentration on teaching and learning, professional teaching, high expectations, positive reinforcement, monitoring progress, student rights and responsibilities, and home-school partnership. School culture is the behavioral pattern and regulation of the personnel in each school, which is to be in the same trend. This stipulated through the belief and the values of the particular school members, and would reflect the school culture. School culture can be defined as the historical transmitted patterns of values, beliefs, norm, rituals, ceremonies, myths, and traditions which build up or inherited overtime within the school, as a procedure for school members to work together. There are ten components included in the school culture i.e. school purpose, empowerment, decision-making, sense of community, trust, quality, recognition, caring, integrity, and diversity.

Sixteen past studies are reviewed in order to make sure that the present research is not repeating the work that someone has already done earlier. The researcher can get
more information, ideas, and intellectual context relevant to research work. After viewing the past researches, it can be seen that the present research studies is a unique research or only one research which indicate the significant difference between the mean scores of school effectiveness belonging to different groups of school culture. The Pearson Product Moment Correlation Co-efficient was used to test the relationship between school effectiveness and school culture. The school effectiveness is the dependent variable of the present study whereas school culture, size of school type of school, and area of school are independent variables.

In order to go for data collection, plan & procedure as well as the development of the tools will be described in chapter 3.