A dirt path winds through a lush, green field of tall grasses and wildflowers. The path leads towards a horizon under a sky filled with soft, white clouds. The overall scene is peaceful and natural.

Ανάπτυξη, Εφαρμογή και Αξιολόγηση  
ενός Πλαισίου Ενσωμάτωσης  
της Μάθησης για Κοινωνική Προσφορά  
στην Εκπαίδευση Εκπαιδευτικών  
με την Υποστήριξη των Νέων Τεχνολογιών

**ΒΙΓΚΟΥ ΚΑΤΕΡΙΝΑ**

ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ  
ΣΧΟΛΗ ΕΠΙΣΤΗΜΩΝ ΑΓΩΓΗΣ  
ΠΑΙΔΑΓΩΓΙΚΟ ΤΜΗΜΑ ΔΗΜΟΤΙΚΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

Ανάπτυξη, Εφαρμογή και Αξιολόγηση ενός Πλαισίου Ενσωμάτωσης  
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με την Υποστήριξη των Νέων Τεχνολογιών

Development, implementation and evaluation  
of a framework for service-learning integration  
in teacher education empowered by new technologies

Βίγκου Κατερίνα

Επιβλέπων Καθηγητής: Βασίλης Μακράκης

Μάρτιος 2020

**Μέλη της τριμελούς συμβουλευτικής επιτροπής:**

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Νέλλη Κωστούλα, Αναπληρώτρια Καθηγήτρια ΠΤΔΕ Πανεπιστημίου Κρήτης

**Μέλη της επταμελούς εξεταστικής επιτροπής:**

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*Time  
I submit to you my thesis  
with you, basically, its subject  
because you have made so far  
what I am now.*

*Dimoula K. (Greenhouse grass, 2005)*

## ABSTRACT

This dissertation presents an attempt to develop, implement and evaluate a framework for service-learning into teachers' education with the use of ICTs (Information and Communication Technologies). The general aim of the dissertation is to investigate the integration of service-learning in a course of Primary School Education Department to give an example of how service-learning could be infused across its study program.

In an ever-changing and complex society, education needs to evolve to reach the needs of the community. Education must promote active citizenship because change is less likely to occur without active citizens. Therefore, education needs to change through teachers. The dissertation attempts to explore preconceptions about service-learning, attitudes towards the principles of service-learning from participants, to evaluate the outputs (participatory videos) developed by participants and to modify an online community of practice to encourage teachers to develop service-learning methods in their teaching.

The methodology of the current research includes the mixed-methods approach as well as qualitative analysis of the data gathered. The sequential explanatory strategy was used.

A website was created to present the outputs (participatory videos) of the courses. At the same time, the website is hosting a community of practice which will enable educators to include service-learning in their teaching methods.

The current study provides an example of how service-learning can be infused in the study program of Primary School Education Department. Students preconceptions about the teaching strategy align with the definition of service-learning. The relationship between the components of service-learning revealed that all synthetic variables connect with the success of service-learning. The results stressed the importance of turning to experiential education strategies, such as service-learning enabled by ICT. Higher education should incorporate more courses that link the content of the courses to voluntary work for the local community.

Keywords: service-learning, participatory video, education for sustainable development, ICT

## SUMMARY IN GREEK

Την τελευταία δεκαετία η Ελλάδα ταλανίζεται από έντονα κοινωνικοοικονομικά προβλήματα. Η οικονομική κρίση μας έχει οδηγήσει σε μία βαθύτερη κοινωνική κρίση. Ολόκληρη η ανθρωπότητα βιώνει τις προκλήσεις μίας μη-βιώσιμης ανάπτυξης. Η παγκόσμια εκπαίδευση δεν μπορεί να σταθεί με απάθεια μπροστά σε αυτές τις πολυδιάστατες προκλήσεις.

Το πρόβλημα είναι ότι η πολυπλοκότητα των ζητημάτων είναι τόσο έντονη και η εκπαίδευση έχει παραμείνει σε τόσο απλοϊκό πλαίσιο αρχών, ώστε να απαιτείται μια επανανοηματοδότηση της τελευταίας ως μια απάντηση στην πολυπλοκότητα των ζητημάτων. Η εκπαίδευση οφείλει να δημιουργεί μέσα από τις πρακτικές της ενεργούς πολίτες, γιατί χωρίς αυτούς δεν θα αλλάξουν τα πράγματα. Η εκπαίδευση χρειάζεται να αλλάξει κι αυτό μπορεί να επιτευχθεί μέσω των εκπαιδευτικών.

Η εκπαίδευση πρέπει να ανασχηματιστεί έτσι ώστε να περιλαμβάνει έννοιες, όπως η βιώσιμη ανάπτυξη, η κοινωνική δικαιοσύνη κι ο ακτιβισμός. Πολλοί ερευνητές μελετούν την αποτελεσματικότητα της εκπαίδευσης ως προς την ενδυνάμωση του “ενεργού πολίτη”. Υπάρχει όμως η ανάγκη για έρευνες που θα μελετούν σε βάθος τέτοιου είδους στρατηγικές μάθησης, όπως η “μάθηση μέσω της κοινωνικής προσφοράς”. Με άλλα λόγια αναδύεται επιτακτική η αναδιάρθρωση ή ο εμπλουτισμός για νέα προγράμματα σπουδών.

Σε αυτή την κρίσιμη συγκυρία η εκπαίδευση καλείται να ανταποκριθεί στις ανάγκες της κοινωνίας με ελάχιστους πόρους. Σε αυτό το πλαίσιο οι εκπαιδευτικοί καλούνται να αλλάξουν ρόλο κι από μεταλαμπαδευτές στείρας γνώσης να γίνουν μετασχηματιστές της ενεργούς μάθησης.

Συγχρόνως, η Ελλάδα την τελευταία δεκαετία πέρασε ολοκληρωτικά στην ψηφιακή εποχή. Σταδιακά από το 2010 μέχρι και το 2019, ο ψηφιακός κόσμος έδωσε λύσεις για ποικίλα γραφειοκρατικά θέματα στην χώρα μας. Η μεγάλη στροφή προς την ψηφιακή εποχή δεν μπορεί παρά να ασκήσει τη δική της επιρροή και στον τομέα της εκπαίδευσης.

Προκειμένου να προετοιμάσουμε τους εκπαιδευτικούς για την εξέλιξη του ρόλου τους, οφείλουμε να τους παρέχουμε την κατάλληλη εκπαίδευση. Η μάθηση μέσω της κοινωνικής προσφοράς έχει τη δυνατότητα να μετασχηματίσει τη διδασκαλία και την μάθηση, ειδικά σε αυτή τη συγκυρία που, ενώ η κρίση στην χώρα μας γίνεται βαθύτερη, η έννοια του εθελοντισμού φαίνεται να αποκτά ευρύ νόημα. Ο εθελοντισμός φαίνεται να ανθίζει στην Ελλάδα και να είναι η καταλληλότερη στιγμή για την προώθηση του. Η μάθηση μέσω της κοινωνικής προσφοράς με το να είναι μία μορφή οργανωμένου εθελοντισμού φαίνεται να αρμόζει στην περίπτωση.

Άλλωστε, την τελευταία δεκαετία στην Ελλάδα παρατηρούμε δράσεις που προωθούν αλλαγές προς πιο δημοκρατικές και βιωματικές μορφές εκπαίδευσης. Η κοινωνία μας περισσότερο από ποτέ χρειάζεται τη συμμετοχή των πολιτών της. Η εκπαίδευση των εκπαιδευτικών θα πρέπει να προσαρμοστεί στις νέες ανάγκες και να προμηθεύσει στους νέους εκπαιδευτικές μεθοδολογίες βασισμένες στη δράση, ευθυγραμμισμένες με τις ανάγκες της εκπαίδευσης για τη βιώσιμη ανάπτυξη. Η εκπαίδευση θα πρέπει να αλλάξει ώστε να συγχρονιστεί με τις απαιτήσεις μιας συνεχώς εξελισσόμενης κοινωνίας. Ο πιο αποτελεσματικός τρόπος να μετασχηματίσουμε την εκπαίδευση είναι μέσω της εκπαίδευσης εκπαιδευτικών.

Η εκπαίδευση χρειάζεται μία στροφή προς τη βιωσιμότητα. Οι μελλοντικές προκλήσεις φανερώνουν την αναγκαιότητα να υπάρχουν ενεργοί πολίτες που θα μπορούν να αντιμετωπίσουν αποτελεσματικά περίπλοκα θέματα. Και αυτό γίνεται, επειδή η επίλυση προβλημάτων με δημοκρατικό τρόπο προϋποθέτει ενεργούς πολίτες. Η μάθηση μέσω της κοινωνικής προσφοράς μετράει πολλά χρόνια στις ΗΠΑ ως μία πολλά υποσχόμενη στρατηγική για την προώθηση της ενεργής πολιτεότητας. Τα τελευταία χρόνια εφαρμόζεται και στην Ευρώπη. Παρόλα αυτά δεν υπάρχει έτοιμο το παιδαγωγικό της μοντέλο. Όπως έχουν δείξει οι έρευνες, οι διαφορετικές παιδαγωγικές μεθοδολογίες της οδηγούν σε διαφορετικά αποτελέσματα. Αυτή η μελέτη προσπαθεί να περιγράψει ένα μοντέλο της μάθησης μέσω της κοινωνικής προσφοράς για την εκπαίδευση που στοχεύει με την υποστήριξη των νέων τεχνολογιών στη βιώσιμη ανάπτυξη.

Με βάση όλους τους παραπάνω προβληματισμούς καθώς και το γεγονός ότι η μάθηση μέσω της κοινωνικής προσφοράς δεν έχει διερευνηθεί ακόμα διεξοδικά στα πανεπιστημιακά ιδρύματα της χώρας μας, ο σκοπός της παρούσας έρευνας είναι:

**“Να διερευνήσει την ενσωμάτωση της μάθησης μέσω της κοινωνικής προσφοράς σε ένα μάθημα του Παιδαγωγικού Τμήματος Δημοτικής Εκπαίδευσης, ώστε να δώσει ένα παράδειγμα σχετικά με το πώς η μάθηση μέσω της κοινωνικής προσφοράς θα μπορούσε να συμπεριληφθεί στο πρόγραμμα σπουδών.”**

Προκειμένου να επιτευχθεί ο σκοπός, οι επιμέρους στόχοι της έρευνας είναι:

- Να προσδιορίσει και να περιγράψει το μάθημα που ενσωματώνει άμεσα τις αρχές και τις πρακτικές της μάθησης μέσω της κοινωνικής προσφοράς.
- Να διερευνήσει τις αντιλήψεις των συμμετεχόντων φοιτητών στο μάθημα σχετικά με την μάθηση μέσω της κοινωνικής προσφοράς πριν τη συμμετοχή τους στο μάθημα.

## SUMMARY IN GREEK

- Να διερευνήσει τις στάσεις των συμμετεχόντων στο μάθημα αυτό, ως προς τις αρχές της μάθησης μέσω της κοινωνικής προσφοράς, μετά το πέρας του.
- Να αξιολογήσει τα μαθησιακά αποτελέσματα των συμμετεχόντων φοιτητών, τα οποία αντικατοπτρίζουν άμεσα και έμμεσα τις αρχές και πρακτικές της μάθησης μέσω της κοινωνικής προσφοράς.
- Να δημιουργήσει μια ηλεκτρονική κοινότητα μάθησης με σκοπό να ενθαρρύνει τους εκπαιδευτικούς να αναπτύξουν μεθόδους για την ενσωμάτωση της μάθησης μέσω της κοινωνικής προσφοράς στη διδασκαλία τους.

Στο πλαίσιο των παραπάνω επιδιώξεων επιχειρήθηκε να διερευνηθούν τα παρακάτω ερωτήματα:

- Πώς αντιλαμβάνονται οι φοιτητές την μάθηση μέσω της κοινωνικής προσφοράς, πριν να γίνει επίσημα η εισαγωγή της μέσω αυτής της μελέτης;
- Ποιες ήταν οι στάσεις των φοιτητών σχετικά με τις αρχές της μάθησης μέσω της κοινωνικής προσφοράς μετά το πέρας του μαθήματος;
- Ποια η αίσθηση των φοιτητών από την εμπειρία τους με την μάθηση μέσω της κοινωνικής προσφοράς;
- Η ενσωμάτωση της μάθησης για την κοινωνική προσφορά ενδυνάμωσε το ενδιαφέρον των φοιτητών για τα κοινωνικά θέματα και για τον εθελοντισμό;
- Ποια ήταν η στάση των φοιτητών σχετικά με την αλλαγή μετά το πέρας του μαθήματος; Γενικά, ήταν οι φοιτητές ευχαριστημένοι με το μάθημα; Πιστεύουν οι φοιτητές ότι μπορούν να κάνουν τη διαφορά στην κοινωνία τους;
- Οι φοιτητές αντιμετωπίζουν τις νέες τεχνολογίες ως κάτι που μπορεί να συνεισφέρει στην κοινωνία, την ανάπτυξη των δικών τους δεξιοτήτων και τη διευκόλυνση της μάθησής τους;
- Σχετίζεται η μάθηση μέσω της κοινωνικής προσφοράς με την ικανοποίηση, την αυτοπεποίθηση και τη στάση τους ως φορείς αλλαγής προς την αλλαγή;
- Υπάρχουν αποτελέσματα στη μορφή παραχθέντων ψηφιακών μαθησιακών εφαρμογών που σχετίζονται με τη μάθηση για την κοινωνική προσφορά;

Στην έρευνα μας έχει χρησιμοποιηθεί η μεικτή μεθοδολογία για τη συλλογή δεδομένων, ώστε να γίνει η διερεύνηση του θέματος σε βάθος, να διασφαλίσουμε την τριγωνοποίηση των δεδομένων και να προκύψουν έγκυρα και αξιόπιστα αποτελέσματα. Πιο συγκεκριμένα αξιοποιήθηκε ο

διαδοχικός επεξηγηματικός σχεδιασμός (sequential explanatory strategy). Τα ποσοτικά και τα ποιοτικά δεδομένα συλλέχθηκαν ταυτόχρονα. Τα διαφορετικά παραδείγματα αλληλεπιδρούν κατά τη διαδικασία της ερμηνείας των δεδομένων.

Η έρευνα είχε διάρκεια δύο ακαδημαϊκά έτη (2013-14 και 2014-15).

Η ενσωμάτωση της μάθησης μέσω της κοινωνικής προσφοράς έγινε:

1. στο μάθημα “Νέες Τεχνολογίες στην Εκπαίδευση για τη Βιώσιμη Ανάπτυξη” για τα χειμερινά εξάμηνα 2013-14 και 2014-15
2. στα σεμινάρια 06 και 07 για τα εαρινά εξάμηνα 2013-14 και
3. στη σχολική πρακτική για το χειμερινό εξάμηνο 2013-14

Όλα τα μαθήματα έγιναν στο Παιδαγωγικό Τμήμα Δημοτικής Εκπαίδευσης του Πανεπιστημίου Κρήτης με υπεύθυνο καθηγητή τον κ. Μακράκη. Οι συμμετέχοντες στην έρευνα ήταν 204 από το μάθημα, 54 από τα σεμινάρια και 23 από τη σχολική πρακτική. Τα ερευνητικά εργαλεία που χρησιμοποιήθηκαν ήταν ερωτηματολόγια με ερωτήσεις κλειστού κι ανοιχτού τύπου, συνεντεύξεις μέσω Skype και ομαδικές συζητήσεις αναστοχασμού των δράσεων .

Οι φοιτητές είχαν την ευκαιρία να γνωρίσουν βιωματικά την μάθηση μέσω της κοινωνικής προσφοράς και με την χρήση των νέων τεχνολογιών τους ζητήθηκε να αποτυπώσουν την εμπειρία τους σε μία ψηφιακή αφήγηση (συνεργατικό βίντεο). Κάποιες από τις δράσεις όπως αποτυπώθηκαν στις ψηφιακές αφηγήσεις ήταν άμεσα συνδεδεμένες με την μάθηση μέσω της κοινωνικής προσφοράς και κάποιες έμμεσα. Όλα τα παραδοτέα συγκεντρώθηκαν σε μία ιστοσελίδα όπου οργανώθηκαν σε κατηγορίες. Η ιστοσελίδα (<http://www.aesop.edc.uoc.gr>), δέχεται επισκέψεις από εκπαιδευτικούς από όλη την Ελλάδα που χρησιμοποιούν τις ψηφιακές αφηγήσεις ως εκπαιδευτικό υλικό. Επιπλέον στην ιστοσελίδα υπάρχει και μία ειδικά τροποποιημένη κοινότητα μάθησης, η οποία θα χρησιμοποιηθεί ώστε να διαδοθεί η μάθηση μέσω της κοινωνικής προσφοράς και να γίνουν ανταλλαγές καλών πρακτικών και συζητήσεις πάνω στην εφαρμογή της.

Ποσοτικά και ποιοτικά δεδομένα συνελέγησαν με την χρήση των παραπάνω ερευνητικών εργαλείων προκειμένου να αξιοποιηθούν τα πλεονεκτήματα και των δύο μεθόδων (ποιοτικής και ποσοτικής). Ο απώτερος στόχος άλλωστε είναι ο μετασχηματισμός της διδακτικής πρακτικής και του προγράμματος σπουδών στο πλαίσιο της εκπαίδευσης για τη βιώσιμη ανάπτυξη. Η μαθησιακή θεωρία επισημαίνει την επιτακτική ανάγκη για την επίτευξη των μετασχηματισμών αυτών, καθότι βασίζεται στο χειραφετικό εποικοδομισμό, στην κριτική παιδαγωγική και βασικά στο μαθησιακό

παράδειγμα ExConTra· δηλαδή συνδυάζεται η εμπειρική μάθηση με την εποικοδομιστική και την μετασχηματιστική μάθηση.

Η μεθοδολογία της συγκεκριμένης εργασίας έχει δομηθεί έτσι ώστε να μπορέσουμε να κατανοήσουμε σε βάθος τα ερωτήματα σχετικά με το πώς η μάθηση μέσω της κοινωνικής προσφοράς μπορεί να ενσωματωθεί στα προγράμματα σπουδών. Τα ποιοτικά και τα ποσοτικά δεδομένα που συλλέξαμε μας προσφέρουν ένα επαρκές βήμα για την ενδελεχή κατανόηση του θέματος. Για την ανάλυση των ποσοτικών δεδομένων χρησιμοποιήθηκαν συνθετικές μεταβλητές, ώστε να μπορέσουμε να διερευνήσουμε τις διάφορες σχέσεις και να διασφαλίσουμε την αξιοπιστία της έρευνας.

Συγκεκριμένα για τις ανάγκες της εργασίας δημιουργήθηκαν πέντε συνθετικές μεταβλητές: ικανοποίηση, μάθηση μέσω της κοινωνικής προσφοράς, στάση για αλλαγή, χρήση νέων τεχνολογιών και αυτοπεποίθηση. Οι λειτουργικοί ορισμοί που δόθηκαν σε κάθε μεταβλητή προήλθαν από τα ερωτήματα που τις απαρτίζουν:

Η συνθετική μεταβλητή “ικανοποίηση” χωρίζεται σε 3 επίπεδα:

1. Αυτογνωσία (να γνωρίζεις τα δυνατά κι αδύναμα σημεία σου, τις προκαταλήψεις σου και τις μεροληψίες)
2. Ανάπτυξη προσωπικών δεξιοτήτων (δεξιότητες συνεργασίας κι επικοινωνίας)
3. Βιωματική μάθηση (σύνδεση της γνώσης και μάθησης, αυτενέργεια)

Η συνθετική μεταβλητή “μάθηση μέσω της κοινωνικής προσφοράς” μετράει την ευαισθητοποίηση των φοιτητών σχετικά με τα κοινωνικά προβλήματα, την προθυμία τους να παρέχουν βοήθεια σε κοινωφελείς οργανισμούς και την ανάπτυξη ατομικών δεξιοτήτων από τέτοιου είδους δράσεις (ενεργοί πολίτες).

Ως «στάση για αλλαγή» ορίζουμε την ετοιμότητα των φοιτητών να αμφισβητήσουν ιδέες, αξίες και πεποιθήσεις, να κριθούν και να κάνουν προσωπικές και κοινωνικές ανατροπές.

Η μεταβλητή “ΤΠΕ” μετράει τη σχέση των νέων τεχνολογιών με τη διευκόλυνση της μάθησης, την ανάπτυξη δεξιοτήτων και τη συνεισφορά στο κοινωνικό σύνολο.

Τέλος, ως “αυτοπεποίθηση” ορίζεται η αντίληψη των φοιτητών σχετικά με το αν μπορούν να έχουν θετική επίδραση και επιρροή σε τοπικό ή/και σε παγκόσμιο επίπεδο.

Οι στόχοι αυτής της μελέτης ήταν η ενσωμάτωση της μάθησης μέσω της κοινωνικής προσφοράς, η ευαισθητοποίηση σχετικά με τον εθελοντισμό, η ανάπτυξη δράσεων με την χρήση των ΤΠΕ και η

αξιολόγηση της διαδικασίας. Τα κριτήρια αξιολόγησης αφορούσαν τη σύνδεση του πανεπιστημίου με την τοπική κοινότητα, τη συνεισφορά στην κοινωνία και την ανάπτυξη ενεργών πολιτών. Η μάθηση μέσω της κοινωνικής προσφοράς ολοκληρώθηκε με επιτυχία, η ευαισθητοποίηση των μαθητών σχετικά με τον εθελοντισμό είναι γεγονός, όπως φαίνεται μέσα από την ερμηνεία των αποτελεσμάτων. Τέλος, οι δράσεις αναπτύχθηκαν και παρουσιάστηκαν μέσω ψηφιακών ιστοριών. Οι συγκρίσεις των αποτελεσμάτων (πριν και μετά τα σεμινάρια) έδειξαν σημαντική αύξηση της συνθετικής μεταβλητής “μάθηση μέσω της κοινωνικής προσφοράς”. Η ενσωμάτωση της μάθησης μέσω της κοινωνικής προσφοράς αύξησε την ευαισθητοποίηση των μαθητών για τα κοινωνικά ζητήματα, την προθυμία τους για εθελοντισμό και την ανάπτυξη των προσωπικών τους δεξιοτήτων (ενεργοί πολίτες).

Η εξέταση της σχέσης μεταξύ των συνιστωσών της μάθησης μέσω της κοινωνικής προσφοράς, κατέδειξε ότι όλες οι συνθετικές μεταβλητές συνδέονται με την επιτυχία της μάθησης μέσω της κοινωνικής προσφοράς. Τα αποτελέσματα της έρευνας φανερώνουν τη σημασία της στροφής προς τις στρατηγικές βιωματικής εκπαίδευσης, όπως η μάθηση μέσω της κοινωνικής προσφοράς με τη στήριξη των νέων τεχνολογιών. Η τριτοβάθμια εκπαίδευση πρέπει να ενσωματώσει περισσότερα μαθήματα που συνδέουν το περιεχόμενο των μαθημάτων με τον εθελοντισμό και τη μάθηση με την τοπική κοινότητα. Η εκπαίδευση για τη βιώσιμη ανάπτυξη απαιτεί νέους τρόπους διδασκαλίας και μάθησης.

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## PUBLICATIONS

During this dissertation, the following publications emerged:

- Makrakis, V., Kostoula, N., Vigkou, K. (2013). An e-service learning platform for developing critical citizenship and community involvement in teacher education institutions. International Scientific Conference Era-8, TEI Piraeus.
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- Vigkou K., Makrakis V. (2014). Developing service-learning enabled by ICT. [in Greek] In P. Anastasiades, N. Zaranis, V. Ekonomides, M. Kalogiannakis (eds.) 9th Panhellenic Conference with international Participation. ICT in Education, Rethymno 3-5 October 2014 (942 -950) ISBN 978-960-88359-7-9
- Vigkou, K. (2015). Development, implementation and evaluation of a framework for service-learning integration in teacher education empowered by new technologies. 1st Scientific Meeting of Doctoral Candidates and Postgraduate Students in Environmental Education / Sustainable Development Education.



## CHAPTER 1: INTRODUCTION

This chapter presents an introduction to the study of service-learning in teacher education. It begins with the statement of the study's problem. The aim and objectives of the study will follow. Afterwards, the research questions will be presented. Finally, a brief discussion on the design, limitations, assumptions and the significance of the study is included.

### 1.1 Statement of the problem

Over the last decade, Greece is falling apart socioeconomically (Mavridis, 2018). Economic crises lead to a social crisis. Unemployment, poverty, social exclusion and uncertainty rise in the Greek territory (Bouras & Lykouras, 2011; Pouloupoulos, 2012) and Greeks struggle to cope with the consequences of the crisis.

*After seven years through the crisis, how the crisis will ultimately be resolved remains unclear. (Nelson et al., 2017).*

Concurrently, humanity is facing the outcomes of unsustainable economic growth. The economic crisis has led to a challenge of the cultural paradigm of which education is a part. Both the financial data and qualitative characteristics have changed dramatically.

Education in Greece is facing significant challenges. According to ETUCE research (2012) in 26 EU countries and 14 non-EU countries:

- in 17 countries there are problems with the recruitment and retainment of teachers,
- in 15 countries there are problems with teachers leaving their job,
- in 5 countries teachers leave their home country to work abroad and
- in 9 countries, teachers leave their home country to work overseas in a different occupation.

In Greece, according to the above research, all four problems occur. Besides, our country is fourth on the list with the most school dropouts and first on the file with the most school mergers. The resignations of 24,000 teachers in Greece since 2008, rank our country first by far. The most massive cuts in teacher salaries were made in our country (30%) and finally Greece comes fourth in cuts in education budgets (Vatikiotis & Nikolakaki, 2013).

Thus, our world must cope with significant injustices and challenges that education cannot and should not overlook. Educational systems' reformation should provide knowledge, skills and tools to transform oneself and society towards a more sustainable future (Makrakis & Kostoulas -

Makrakis, 2013). Ketschau (2015) highlights the need for social justice and notices that there is no education-specific concept of social justice. **Thus, the problem is that our society is so complex, and education needs to evolve to reach the needs of the community. Education must promote active citizenship because change is less likely to occur without active citizens. Therefore, education needs to change through teachers.**

Education has its shortcomings. However, by understanding how students define social justice and how they translate their ideas into actions social work educators, researchers, and practitioners can develop curriculum and interventions that will promote lifelong activism (Richards-Schuster, Espitia, & Rodems, 2019). Many researchers explored the effectiveness of higher education institutions at fostering civic engagement (Torney-Purta, 2015; Ferraiolo, 2004). The need for more informative research than just counting how many students participating in service-learning occurred. In response to this demand for higher education to establish its contribution to society, in conjunction with mounting concerns about students' civic engagement, universities have the leading role in increasing civic participation and empowering democracy (Ostrander, 2004). Higher education institutions should transform their curricula to support the development of active citizenship.

At this crucial time, education is called upon to respond to pressing needs with fewer resources. In this context, teachers are increasingly called upon to shift from roles of being knowledge transmitters towards knowledge transformers by taking an active part as agents of change.

Meanwhile, according to the “Digital Government Factsheet” (European Commission, 2019), gradually from 2010 to 2015, there seems to be a complete shift towards the digital world for Greece. The digital world takes a leading position, changing facts and provides solutions for various issues. But even while Greece is making steps towards a digital future, it still needs to focus on its education. It has to adjust its education system to ensure that all students obtain the necessary foundation skills in reading, mathematics, science, and problem-solving (Bodewig & Fengler, 2019).

To prepare teachers to function within these roles, we need to educate them accordingly. Service-learning in teacher's education has the potential to transform teaching and learning (Vaughn et al., 2004). Most importantly, as the financial crisis deepens and new forms of social behavior are emerging, the concept of volunteering seems to be getting wider (Kopanou, 2012).

Volunteering today is a vast force of hope for the contemporary world. According to a European Union survey (Monitoring Public Opinion Unit, 2011) Greece is one of the countries in the European Union where volunteering is less prevalent. However, The General Secretariat for Youth (2012) suggested a meaningful increase in volunteering and volunteer organizations over the last two decades in Greece. However, volunteering by itself has no real meaning unless it is connected to learning. This is what service-learning is about.

One form of organized volunteering is service-learning. According to Anderson & Pickeral (1999), when service-learning was applied to the education of students in Primary Education, it provides valuable assets to the community, students and students' pedagogical knowledge. In addition, research has shown that service-learning can significantly contribute to more effective education of students (Osgood, 2006). Higher education institutions implement service-learning activities that bring their students' educational benefits. Service-learning enriches teaching and learning, bridges the gap between theory and the real world, and offers both educators and students the opportunity to engage in research and maintain an active role in their community. Further useful research, evaluation and reporting can help service-learning researchers to provide data on the academic accomplishments that teachers and other stakeholders seek (Karayan & Gathercoal 2005).

Service-learning can be achieved in a variety of ways but may be most effective when conducted as experiential learning. Triliva & Anagnostopoulou (2008) describe experiential learning as an alternative teaching strategy in contrast to the traditional way of teaching (frontal teaching, memorisation). It is essential to note the missing element for experience leading to learning is the reflection on the experience (Boud et al., 1985). Reflection is the notion which differentiates service-learning from volunteerism. During the last decade, in Greece, we observe actions that promote a change toward democratic and experiential learning. Experiential education is becoming the norm in many classrooms across Greece. Private schools with an emphasis on experiential learning approach appeared recently in the Greek educational scene, like Trianemi 2007 and Big Bang School 2019. In addition, there is an increased interest for democratic education. It is worth mentioning that a Greek department of EUDEC (European Democratic Education Community) has been founded.

The democratic society is at a precarious point. It is trying to respond to the increasingly complex challenges in local, national and international level. Participation of the citizens is the key to a thriving democratic society. Verba et al. (1995) underline that participation is insufficient on its own, and competent citizens are those who will shape the future of civil society. To conclude,

teacher education should be readjusted to this reality and provide future educators with teaching methodologies that are based on experience promoting education for sustainable development. Overall, education must change to meet the demands of an ever-evolving society. The most effective way to reform education is through pre-service training for teachers.

## 1.2 Aim and objectives

The literature review clearly states that it is essential to research the field on different types of institutions. The emerging of service-learning in Europe has been counting a decade already. In Greece, there has been no research into the method and its effects on our institutions. Since teachers' education multiply its results, it provides fertile ground for such research.

The main aim of this study was:

**"To investigate the integration of service-learning in a course of Primary School Education Department at the University of Crete entitled "ICT in Education for Sustainable Development" that presents a good example of how service-learning could be infused across the whole study program."**

To reach the above aim, this study sought to accomplish the following specific objectives:

- **to identify and describe a course that directly infuses service-learning principles and practices in its content;**
- **to investigate students' preconceptions about service-learning before starting the course.**
- **to explore students' attitudes towards the principles of service-learning after its completion;**
- **to evaluate the outputs developed by participating students which reflect directly and indirectly service-learning principles and practices;**
- **to create an online community of practice to encourage pre-service and in-service teachers, so that they will infuse service learning principles in their teaching, thus being able to develop relevant service-learning applications.**

## 1.3 Research questions

The following research questions were addressed to accomplish the above goals:

- **How did the students perceive service-learning before being formally introduced to it ?**
- **What were the students' attitudes towards the principles of service-learning after taking the course?**

What sense did the students make of their service-learning experience?

Did the integration of service-learning raise students' awareness of social issues and volunteering?

What were the students' attitudes towards change after the course? Overall, were students satisfied with the course? Did students believe they can make a difference in their communities?

**•Did students see ICT as something that can contribute to their teaching and service-learning in society, the development of their own skills and the facilitation of learning?**

**•Is service-learning related to the students' satisfaction, confidence and the attitude towards change?**

**•Have students produced digital artifacts that can be considered good examples of service learning?**

#### 1.4 Research Design

This study took place at the Department of Primary School Education at the University of Crete (UOC) located in the city of Rethymno, Crete. There is a focus on active citizenship within the university's mission. At the time of this study, UOC had an enrolment of about 20.000 students. The department of education had 180 new students enrolled each academic year. All students were obliged to take the course ICT in Education for Sustainable Development and besides that a number of optional courses dealing with ICT and Education for Sustainable Development were offered such as:

- the "Internet and Communication Technologies in Education for Sustainable Development" course (ICT in ESD).
- "Design and development of teaching material in an online environment and exercises (Γ03Σ06)" seminar,
- "E-learning - Educational use of the Internet and exercises(Γ03Σ07)"

The service-learning model involved the students of the Department of Primary School Education in the planning and implementation of a service-learning project. In teams, students, worked together so as to identify a sustainability issue of the local community according to the Sustainable Development Goals. Afterwards, they worked in teams to design a plan to meet the identified issue. The instructor encouraged students to take action. At the end of the procedure, each team created a storyboard and produced digital storytelling content. A few examples of the topics that students had chosen are: raise awareness on racism, advocate on the issue of energy waste, promote recycling in

university campus space, participate in elections, protect public space and many more. Last but not least, a reflection on the experience throughout focus groups and course discussions occurred.

In addition to investigating the integration of service-learning in a course, this study also created a website to categorise the service-learning digital products students developed during the course and make them easily accessible to Greek teachers. An online community of practice was modified and integrated in the website to encourage teachers to develop service-learning methods in their teaching.

### 1.5 Limitations - Assumptions

A few issues were regarded as limitations to this study. It is crucial to acknowledge that the researcher and the instructor of the course are not the same person. So, while this ensured higher independence of the research, the perspective of the instructor would have been different.

The researcher conducted the interviews, supported the course's progress, evaluated the final videos and took part in both presentations of the final results/videos. There was also continuous support on technical or other issues during the courses. Many of the videos that students created had an emotional effect on the researcher, so the analysis of the data started a year later to be able to focus on the data itself. At the same time, the researcher was an active primary school teacher, and that gave her the chance to use and promote the educational material produced.

The sample of this study was limited to students of the Primary School Department of the University of Crete. This ensured a small and rather homogeneous group of individuals who served the purposes of this study as a first step in the emerging of service-learning in Greece. However, due to the limited sample size, the findings of the research should not be considered as representative for making conclusions on service learning in higher education.

The researcher made a few assumptions for this research study. The researcher assumed that students accurately describe their experiences, perceptions and beliefs. The researcher also assumed that those who participated in the study wanted to get a degree in Primary School Education.

### 1.6 Significance

This study will add to the literature on service-learning in teacher education. The focus of the study is to increase students' awareness of volunteering. In addition to that, the connection between the university and the local community under the umbrella of the Sustainable Development Goals with the use of ICT will be highly empowered. The study aims to integrate service-learning and

give an example of how service-learning could be infused across its study program. Professors include experiential teaching strategies in their courses and this study aims to provide them with one more "arrow in their quiver". Service-learning is now emerging in Europe, and this study can add to the discussion on service-learning in a pre-service teachers' education program.

Additionally, this study offers a bibliographic reference for the connection between Education for Sustainable Development enabled by ICTs with service-learning. Currently, in Ireland and Spain, projects are emerging to integrate service-learning in higher education curricula. This study offers a methodology to implement a service-learning course in a study program of higher education in Greek universities.

Service-learning could be the "door" of Greek universities to the local communities. Service-learning integrated can create a healthy, reciprocal relationship between communities and universities. A much-wanted step towards the extroversion of higher education.

## 1.7 Chapter Summary

Education necessitates a shift toward sustainability. Future challenges show us the need for active citizens who can effectively address complicated issues. Democratic problem-solving demands active citizens. Service-learning counts many years as a promising strategy for developing civic competence in the USA, and it has recently been emerging in Europe. However, there has been no transparent pedagogical model yet. As research reveals, various educational methodologies lead to distinct results. This study sought to articulate a model of service-learning for Education for Sustainable Development enabled by ICT. The method proposed is a contribution of how service-learning could be infused across educational department's study program to shift education towards education for a sustainable future.

## CHAPTER 2: LITERATURE REVIEW

The theoretical framework described below, does not only provide the structure within which this study was conducted, but it also strengthens the theoretical framework on which I base my daily teaching practice. Working on this PhD thesis, I did an extensive literature review to find out that Dewey, Freire, Steiner and Pestalozzi whom I have already admired and studied since the first steps in the field of education, were also those who would lead the literature review of this thesis.

The theoretical perspective of this study draws from the classical theories of Aristotle and Plato the notions of practical knowledge and active citizenship. Pestalozzi and Steiner contribute to the principle of joint learning and actions applied. Dewey offered us a theoretical framework for service-learning as a part of the curriculum, and Freire added the philosophical component of the critical theory. A common perspective on how we acquire knowledge and an active link between experience and the way we learn are intertwined, thus combining all the theories above. (Plato, 1992; Kristjansson, 2012; Smith, 1999; Ullrich, 1994; Mantzanas, 1993; Dewey 1997, 2011; Freire et al., 2018.) The ExConTra learning Model combines the above theories and presents its independent but interconnected components which strengthen the theoretical foundations of service-learning (Makrakis & Kostoulas-Makrakis, 2012).

### 2.1: Defining service - learning (interchangeability)

Service-learning, as a term started being used, in the late '60s. Stanton et al. (1999) trace the earliest definition of service-learning back in 1969, in publications of the Southern Regional Education Board (SREB) in Phillips, 2014, p.751:

*“the accomplishment of tasks that meet genuine human needs in combination with conscious educational growth”.*

Essential ingredients for service-learning since the early years, seem to be human needs and educational growth. Ten years later, Sigmon, 1979, p.9 in his foundational article “Three principles”, describes service-learning as:

*“the coming together of many hearts and minds seeking to express compassion for others and to enable a learning style to grow out of service”.*

Pioneers of service-learning seemed to be concerned with developing learning opportunities for students within their societies. Service should result in profit for both the community and the students.

The roots of service-learning definition had emerged and what we can distinguish in both definitions is still one of the fundamental characteristics, the double profit. By double profit, we imply the positive effects in both society and students.

In the same article, Sigmon, 1979, p.11 notes and underlines the importance of moving towards a more precise definition for service-learning and names three principles of service-learning:

- I. Those being served control the service(s) provided.
- II. Those being served become better able to serve and be served by their actions.
- III. Those who serve are also learners and have significant control over what is expected to be learned.

Sigmon (1979) has underlined the importance of a widely accepted and precise definition of Service-Learning almost 40 years ago. However, in 2019, we still have not concluded in a universally accepted one. Having no such definition creates various problems and confuses researchers to measure the effect of service-learning (Furco, 2003).

Service – LEARNING	Learning goal primary; service outcomes secondary
SERVICE-learning	Service outcomes primary; learning goals secondary
service learning	Service and learning goals separate
SERVICE-LEARNING	Service and learning goals of equal weight; each enhances the other for all participants

**Table 1. A service and learning typology**

**Source: Sigmon (1996)**

As we observe in Sigmon’s typology, he uses capital letters to show where the emphasis is each time. While we write both terms with lowercase letters, their goals are separate. Using uppercase letters for both terms, Sigmon (1996), defines the term for this thesis. Service and learning goals are of equal weight and double profit for all participants. In agreement with Sigmon, Furco (1996) underlined that service-learning’s main distinction from other experiential education approaches is

the equal benefit for the provider and the recipient. At the same time, Furco (1996), admits that there are still many grey areas when one tries to move towards a more precise definition.

Jacoby, 1996, p.5, defines service-learning in her book:

*“Service-learning is a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development. Reflection and reciprocity are key concepts of service-learning.”*

In the above definition, the emphasis goes to the structure of a service-learning course that needs a specific design and should include reflection. Reciprocity remains an integral characteristic.

The National Service-Learning Clearinghouse (n.d.) gives the following definition:

*“Service-learning is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities.”*

The above is a widely used definition which adds to the previous definitions the element of civic responsibility.

Most of the recent definitions underline the importance of reflective thinking and civic responsibility. Service-learning definition by Gottlieb & Robinson (2002) as:

*“the combination of community service and classroom instruction, with a focus on critical, reflective thinking as well as a personal and civic responsibility.”*

Felten & Clayton (2011) in their attempt to define service-learning include Bringle & Hatcher (1995, p. 112) definition as probably the most cited operational definition:

*“Service-learning is a course-based, credit-bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way as to gain*

*further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility.”*

Similar definitions for service-learning exist in many books and articles. A literature review through the range of definitions could provide us with the core elements of service-learning. Felten & Clayton (2011) conclude that all definitions of service-learning converge to the following characteristics:

- I. Advance academic and civic goals
- II. Community purposes
- III. Reciprocal collaboration among all partners
- IV. Shared objectives and competence to deliver
- V. Critical reflection
- VI. Assessment processes
- VII. Carefully designed on service-learning principles
- VIII. Meaningful learning
- IX. Service outcomes

To complicate matters, the term: “service-learning” is used interchangeably with various terms, such as community-based learning, internship, community service, community-based service-learning and many more. Despite the perplexity of the issue, with an attentive literature review, one remarks that most of the terms are differentiated and each one has its unique characteristics.

Kendal in Jacoby (1996) states that she took part in many debates about the words used in combining service and learning. Moreover, she mentions that she encountered 147 terms used to express the basic concept of service-learning. There must be even more in use by now.

Although there are so many terms which are being used interchangeably sometimes, there are some important distinctions between them. Cress et al. (2005) in fig. 2 explores some of the terms' differences. Volunteerism depends on service, and informal learning may occur. Internships aim to develop students' capacities and offer them experience in their field. In community service students participate in activities without any structured learning plan. In community-based learning, the profit is double, and there are academic goals, but it lacks the opportunity for reflection. As aptly

said by Howard (2000) with service-learning, the community service is understood to be one of the “texts” in the course.

To sum up, service-learning consists of various elements from the terms that have been used interchangeably. The difference lies in its reciprocal quality with profit for both students and communities. Service-learning practices reflection and it constitutes a solid structured course connected to the curriculum.

- **Volunteerism:** Students engage in activities where the emphasis is on service for the sake of the beneficiary or recipient (client, partner).
- **Internship:** Students engage in activities to enhance their own vocational or career development.
- **Practicum:** Students work in a discipline-based venue in place of an in-class course experience.
- **Community Service:** Students engage in activities to meet actual community needs as an integrated aspect of the curriculum.
- **Community-Based Learning:** Students engage in actively addressing mutually defined community needs (as a collaboration between community partners, faculty, and students) as a vehicle for achieving academic goals and course objectives.
- **Service-Learning:** Students engage in community service activities with intentional academic and learning goals and opportunities for reflection that connect to their academic disciplines.

*Figure 1. Distinctions between terms*

*Source: Cress et al. (2005)*

Weigert (1998) names six elements which differentiate service-learning. Service-learning meets three of which focus on the community:

- I. meaningful community service
- II. service meets a need or a goal
- III. community defines the need or goal.

There are three more elements which focus on the campus:

- I. course objectives bring out the service
- II. reflection is necessary and integrated to the service experience aligned with course objectives
- III. assignment is going through assessment and evaluation

## 2.2: The roots of service - learning

The roots of service-learning can be traced back in ancient Greece and to the classical theories of Aristotle and Plato. Aristotle divides knowledge into three categories: theoretical, productive and practical. Carr & Kemmis (1986) in Smith (1999) analyze Aristotle and describe that the theoretical discipline will pursue the truth through contemplation; its telos is the only success of knowledge. Theoretical is everything which is not productive or practical, what we nowadays call science. Carr & Kemmis (1986) in Smith (1999) explain that the purpose of the productive sciences is to make something; their telos is the production of some artefact. Productive knowledge includes creation, such as poetry, agricultural, painting, building. The practical disciplines are those sciences which deal with ethical and political life; their telos is practical wisdom and knowledge (Carr & Kemmis 1986: 32 in Smith 1999). Practical knowledge involves how we should cope with private and public issues.

Kristjánsson entitles service-learning as the modern method of moral education, which comes closer to Aristotle's description (Kristjánsson, 2012). Plato (1992) in the Republic, offers us a fantastic dialogue, emphasizing leadership topics with various implications on knowledge and education. Those thoughts on the education of citizens form the foundation of experiential education. Thus, when tracing any form of experiential education through a historical point of view, our theoretical influence starting point will be Aristotle and Plato.

Ancient Greek philosophers delineated community service as an educational goal through their impact on educational theories and Pestalozzi built foundations for the new field of experiential education (Smith & Knapp, 2009). So as we continue our journey to the timeline of service-learning, we should have a look in Johann's Pestalozzi work, who was referring to labour as a means of education. He believed that education should focus on the power of head, heart, and hands. Spending time for labour within the school curriculum was an original, revolutionary idea for modern pedagogy. The main aim of this pedagogy was to give students a chance to develop physical and mental abilities through action and experience. According to Pestalozzi, students should make visible and tangible everything they learned (Mantzanas, 1993).

Even though there are more classical theories with similar roots and aims, none of them could constitute a robust theoretical framework for service - learning. According to Eyler & Giles (1994) the educational and social philosophy of Dewey, theories could encompass the idea of service-learning. Ancient Greek philosophers, outlined community service as an educational goal through

their impact on educational theories. However, Dewey was the one to shape the idea of service-learning as a part of the educational curriculum itself (Speck & Hoppe, 2004).

Dewey's theory consists of four aspects, according to Harkavy & Benson, 1998, p.11:

- (1) *“Reflective thought is an active response to the challenge of the environment” (Smith 1983, p. 124 in Harkavy, I. & Benson L., 1998)*
- (2) *Individuals learn best when they participate “in the formation of the purposes that govern their activities” (Nicholls & Hazzard, 1955, p. 114 in Harkavy, I. & Benson L., 1998)*
- (3) *All individuals can contribute to knowledge.*
- (4) *The fundamental purpose of knowledge is to improve human welfare.*

Dewey (1997) presents his official position in educational philosophy in his book: “Experience and Education” where he insists on the careful development of a philosophy of experience. Dewey (1997) urges that we should combine education based on experience with critical thinking. Experience is not just any random action, but an action which is being followed by reflection, in order to gain knowledge. Otherwise, our actions might be routine or random actions, and we will not gain a real experience upon which knowledge, wisdom, understanding and meaning are built. His theory of experience still influences educational strategies worldwide. As a result, he received the title of the philosophical father of experiential learning. It is crucial to realise that Dewey (1997) insists on well structured experiential learning followed with reflection, and coordinated by teachers. Students themselves cannot lead their experiential learning to find knowledge, and without reflection, there is no knowledge gained. Dewey (1997) is mentioned reasonably as the founder of service-learning in education.

Freire's description of pedagogy offers the component of critical pedagogy on service-learning (Freire et al. 2018). Learners become co-creators of knowledge and build cooperation with teachers. Dialogue leads the learning process, and the setting encourages questions and expression of views (Shih, 2018). Critical pedagogy examines the way teachers are teaching, the subjects, as well as the process of learning. There is a connection between education, politics, imperialism and liberation (Breunig, 2005 in Shih, 2018).

The foundation of service-learning theoretical roots counts many years of evolution. Pestalozzi and Steiner used “service” as a component of their teaching. Pestalozzi believed that students have to turn into action everything they learnt, and Steiner wanted a balance between knowledge and

actions in order to create a balanced learning experience (Mantzanas, 1993; Ullrich, 1994). However, as an educational approach appearing for the first time in the 1970s, it spread throughout the 1980s and gained recognition during the 1990s in the United States (Mc Hugh, n.d.; Iverson & Epenschild - Reilly, 2010). Before 1990, service-learning, as a teaching method, was used occasionally in primary schools of the USA.

Although service-learning is a popular teaching method in North America, it is mostly absent from Europe. Until recently, the award-winning programme: “Students Learning with Communities” from the Dublin Institute of Technology was the only European example of service-learning, according to Mikelic et al. (2007). Luna (2012) observes that service-learning practices are at an early stage in Europe. The first organised attempt began during the 21st century while organisations and programmes appeared. According to Luna (2012), the first international conference on service-learning in teachers’ education took place in 2007 in Brussels, Belgium and the second in Galway, Ireland (2009).

As Umpleby & Rakicevik (2008) observe, Europe will follow the example of the USA and integrate an interactive teaching model in higher education. With such an action, there is a double profit for universities. On the one hand, they contribute to their local societies and, on the other hand, they promote democratic values.

Bunning & Shilela (2009) analyse the changes that occurred after the Bologna Declaration (1999) in the traditional system of TVET Teacher Training and refer to the lack of practice as one of the main points which seek improvement. At the same time, Spanish universities use the Bologna framework to support the integration of service-learning to higher education. Colas et al. (2017) recognise the engagement of universities with society as higher education’s third goal, together with teaching and research. Service-learning is suggested as the primary teaching strategy to reach the third goal (Colas et al., 2017). In the last decade, more service-learning projects emerged, and as a result, the teaching method starts to integrate into many higher education institutions in Europe.

### **Campus Engage (Ireland)**

*Campus Engage promotes and supports civic and community engagement (CCE) as a core function of Irish higher education. (Campus Engage, n.d.)*

**Civicus (Lithuania)**

*Civicus “, Dialogue Between Universities and Communities,” was a Leonardo da Vinci programme coordinated by VMU Lithuania (Higuera et al., 2019).*

**EuropeEngage (Spain)**

*The overall aim of ‘EuropeEngage’ will be to promote S-L as a pedagogical approach that embeds and develops civic engagement within higher education, students, staff and the wider community. (EuropeEngage, n.d.)*

*The partner universities in Europe Engage include; Autonomous University of Madrid, Spain; National University of Ireland, Galway, Ireland; Erasmus University of Rotterdam, Netherlands; Ghent University, Belgium; ISPA – Instituto Universitário de Ciências Psicológicas, Sociais e da Vida, Portugal; IMC University of Applied Science-Krems GmbH, Austria; University of Bologna, Italy; University of Brighton, United Kingdom; University of Duisburg-Essen, Germany; University of Helsinki, Finland; University of Zagreb, Croatia and Vytautas Magnus University, Lithuania.*

In Greece, there are very few references for service-learning. The American College of Thessaloniki claims to operate one of the most extensive service-learning programs (ACT, n.d.). The Center for Hellenic Studies of Harvard University offers a five-week Service-Based Learning Program in Nafplio for students of both Greek and American universities (CHS - Harvard University, n.d.). The Greek America Foundation via the Hellenic American University offers a serving-learning program with the option to accrue college credit as a response to the refugee and financial crisis of the country (Service-learning Program, n.d.). The Webster University in Athens runs a “Community Service Program” and a “Community Service-learning Course” (Cultural Awareness/Diversity, n.d.). The American College of Greece offers service-learning opportunities for students, during the summer of 2019, the Pierce Leadership Academy offers a module entitled: “Human rights, sustainable development and service-learning.”. The module invites guest lecturers

from the NGO partner, ActionAid Hellas (Human Rights, Sustainable Development and Service-Learning, n.d.).

### 2.3: Community, civic competence and reflection

One of the biggest challenges in the education field is students' engagement with the community (Rotherham & Willingham 2009; Summerlee 2010). Education strives to make the opening towards the community, but like most changes, it takes time and effort.

McMillan & Chavis (1986) propose four elements to define the community.

- I. Membership
- II. Influence
- III. Reinforcement
- IV. Shared emotional connection

Members of a community have the feeling of belonging or of sharing a sense of personal relatedness. Moreover, once belonging in a community, there must be dual interaction. Members will feel that they belong and their need will be met. Last but not least, members of a community have shared memories, shared history, familiar places, time spent together and many more similar experiences (McMillan & Chavis, 1986).

Community through an educator's viewpoint is much more than a verbal tie between the words common, community and communication (Dewey, 2011). Aims, beliefs, aspirations and knowledge are the shared core in order to form a community, according to Dewey (2011).

If community engagement for students is our goal, we need to develop curricula which promote civic competence. However, what is competence? By competence, according to Hoskins & Deakin (2008), we mean a diverse unification of knowledge, skills, perception, values, attitudes and desire, which aim to social action in the world, in a distinct field. Therefore, combining knowledge, skills, understanding, values, attitudes and desire, we reach the ultimate goal, which is action. The competence of engaging in the community is the civic competence, a mix of various learning outcomes which are necessary for an active citizen.

### 2.4: ExConTra and service-learning

*"Service-learning briefly defined is a form of experiential education in which students engage in activities that address human and community needs together with*

*structured opportunities designed to promote student learning and development" (Garbus, 2002).*

Experiential learning theory or ELT developed and published by David A. Kolb in 1984. ELT is a learning process which involves absorption and transformation of knowledge via experience (Kolb, 1984). ELT is the most influential theory, especially in the area of managerial and leadership learning and development. The fact that it can be applied individually as well as in teams makes its popularity and international acclaim of great importance (Clegg & Bailey, 2008).

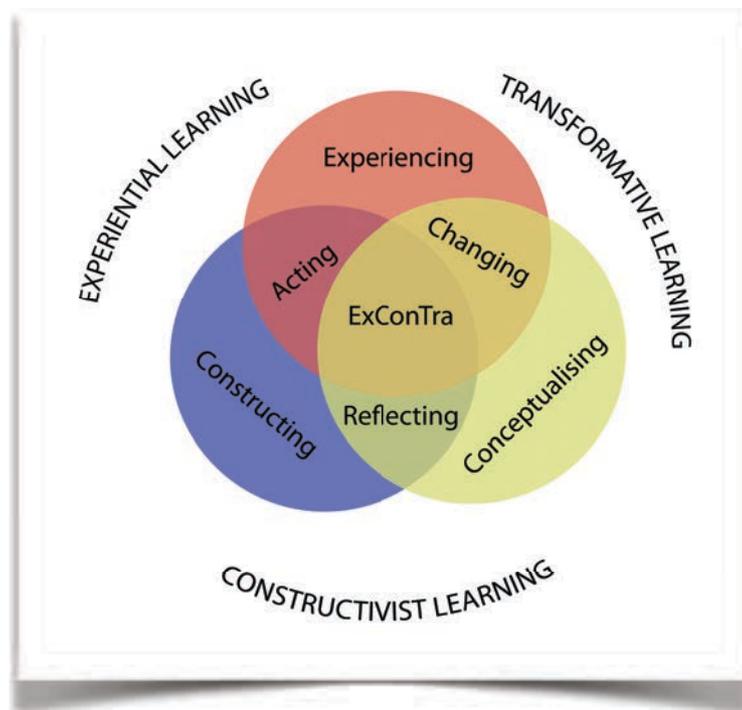
Constructivism (also mentioned as constructionism and firmly linked with social constructivism) is a broad-ranging label capturing several different epistemological views within the social sciences. Constructivists claim that social reality is not grounded in facts and conditions that are independent of human interaction, language, and symbolism. Social reality is not an immutable and independent order but is what is emerging in social interaction and the use of symbolism and language. Constructivist thinking is therefore critical of attempts at portraying social reality as independent of time and space, local conditions, and beliefs and practices, but also emphasizes the contingent and contextualized nature of the social organization. (Clegg & Bailey, 2008)

Transformative learning mostly refers to training from a specific worldview, a particular educational philosophy. It is also not an easy way to teach. Wearing the title, or moniker, of a transformative educator "should not be taken lightly or without considerable personal reflection. Although the rewards may be great for both the teacher and the learner, it demands a great deal of work, skill, and courage" (Taylor, 2006, p. 92 in Taylor, 2008). It means asking oneself: "Am I willing to transform in the process of helping the students transform?" In other words, teaching without developing a deeper awareness of our frames of reference and how they shape our practice, makes it less possible to foster change in others (Taylor, 2008).

Makrakis & Kostoulas-Makrakis (2012) have conceptualised a construct abbreviated as ExConTra, that corresponds to Experiential learning, Constructivist learning and Transformative learning (Fig.2). As indicated in the ExConTra learning model, one of the vital principles is collaboration and shared knowledge (Makrakis & Kostoulas-Makrakis, 2012). Moreover, EL-Deghaidy (2012) notes that the ExConTra model consists of six independent but interconnected components. These are experiencing, reflecting, conceptualising, constructing, acting and transforming, all of which happen throughout the process of action research.

As the field has matured, Felten & Clayton (2011) point out that the range of definitions has converged on several core characteristics. Service-learning (SL) experiences include:

- I. Academic and civic learning goals as well as social goals
- II. Cooperation between students, community members and organisations, university staff and educational institutions to accomplish common aims and build capacity among all associates
- III. Reflection and evaluation that are purposely designed to compose and document meaningful learning and service results



**Figure 2. The ExConTra Learning Model**

**Source: Makrakis & Kostoulas-Makrakis (2012)**

Bamber & Les Hankin (2011) connect SL core characteristics with transformative learning, writing that:

*“The main goal of transformative learning is to enable students to develop their own meaning perspectives that guide their action by helping them interpret evidence. Perspective transformation through a service-learning experience may emerge where the “unfamiliar” helps participants to question the “familiar”.*

*Similarly, immersion in an SL context may act to challenge stereotypes and personal values as well as expose participants to surprising information that contradicts their*

*previously accepted presuppositions. Through critical reflection, the students undergo a process of “defamiliarisation” whereby they “break with the taken-for-granted and set the familiar aside” (Greene, 1995, p. 3 in Bamber & Les Hankin, 2011).*

They conclude that in order to elevate the outcomes of SL towards their transformative potential, the possibilities for learning that are afforded by such ventures must be relentlessly exploited both in the short and long term.

According to Keengwe & Onchwari (2011), constructivism is an educational theory that emphasizes hands-on, activity-based teaching and learning during which learners develop their frames of thought. Piaget's notion of constructivism theory assumes that learners have to construct their knowledge, individually, and collectively.

The constructivist theory assumes three basic principles that include:

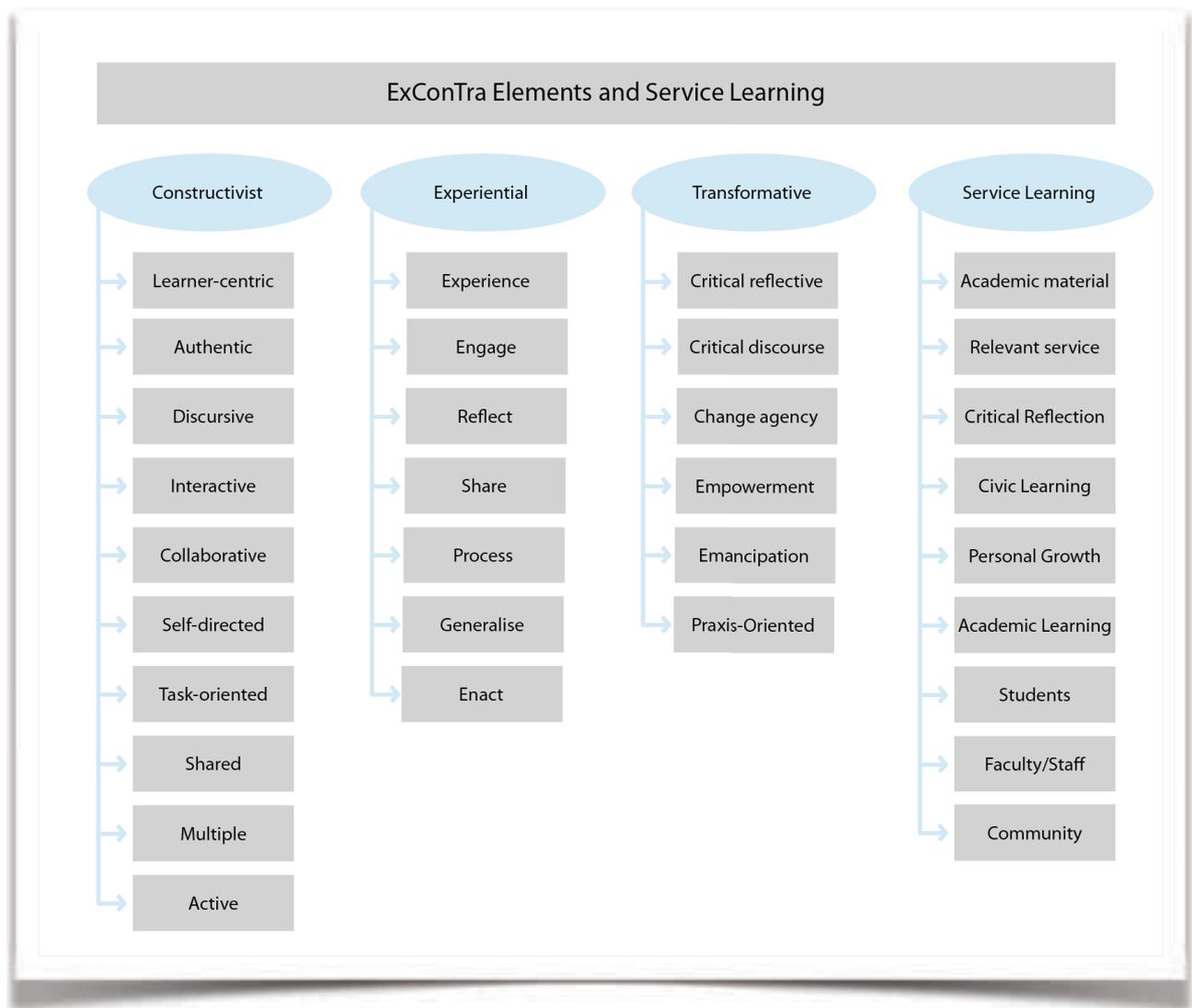
- I. learners forming their representations of knowledge
- II. learning through active experience and exploration that uncovers inconsistencies between current knowledge representation and their own experiences
- III. learning within a social context, with interaction between learners, peers and other members of the learning community. (Keengwe & Onchwari, 2011)

Cooperstein & Kocevar-Weidinger (2004) underline that although stressful and time-consuming, constructivist learning has many benefits. In our modified constructivist approach, carefully planned, structured, directed activities lead students to discover concepts and develop skills. Abstract concepts become meaningful, transferable, and retained because they are attached to the performance of an activity. The activities lead to concepts; the students construct the meaning.

Reciprocal, authentic relationships—such as those that underlie service-learning at its best provide conditions well suited to transformative learning as Felten & Clayton (2011) support and as proven above also to constructivist learning and experiential learning (ExConTra).

Service-learning is aligned to the realm of ExConTra learning because the content exists in sub-themes that serve as learning contexts for experiencing, constructing and transforming knowledge with action for change. Service-learning starts from experience and, will allow the learners to take over a relevant to their academic material service in their communities, which will be followed by critical reflection. Serving-learning will be the learning context for students to experience, engage,

reflect, share, process, generalize and enact. Arriving at individual and shared meaning (constructing), learners need to get involved in a shared inquiry enriched through continuous reflection, re-conceptualization and active experimentation. In this sense, learning will be an active and contextualized process of constructing meaningful knowledge based on one's own experiences, rather than acquiring it from someone else. Constructed knowledge and meaning is meaningful when it opens up opportunities for action in our case through service-learning. Merging knowledge and meaning with action (acting) implies a changed potential and active citizenship. Learners are transformed to change agents and enrich themselves with growing experience through critical reflection and active experimentation. When critical reflection turns into an action, it becomes praxis that turns learners able to transform oneself and society (transforming) (Makrakis & Kostoulas-Makrakis, 2012).



**Figure 3. ExConTra and Service-Learning**  
**Source: Makrakis & Kostoulas-Makrakis (2012)**

ExConTra learning is a good fit for service-learning. Teachers should also be committed to playing a leading role in promoting other teachers' professional development in their schools, acting as resources and facilitators for service-learning (Makrakis, 2006 in Makrakis & Kostoulas-Makrakis, 2012). Service-learning, combined with ExConTra learning, requires a shift for both curricula and teaching. As Makrakis & Kostoulas-Makrakis (2012) support, shifting from content-centred curricula to competency-based and life-skills curricula goes in parallel with shifts from teacher-centred teaching to student-centred learning enabled by ICTs.

All the above are tabulated in fig. 3, where one can find many interconnections between the ExConTra elements and service-learning. The service-learning foundation is on critical education (e.g., critical reflection, experiential, situated learning, civic learning) that is in alignment with the ExConTra learning paradigm.

A constructivist view of learning means to encourage students (learner-centric, interactive, self-directed) to use active techniques (shared, collaborative) to create more knowledge and then to reflect on how their understanding is changing (construct new knowledge, multiply). According to Makrakis & Kostoulas-Makrakis (2012), constructivist principles assume that learning happens by the active construction of knowledge supported by various perspectives and social interactions that play a critical role in the processes of learning and cognition. Service-learning enables students to undertake education anywhere, anytime and in this way, fill various gaps and empower constructivist learning.

Experiential learning emerges in the definition of service-learning. Service-learning provides students with the opportunity to share, experience, enact, engage and reflect. Looking at the history of service-learning, it seems that experiential learning is its ancestor. Therefore, one could support that the best way to look at service-learning is through the filter of experiential theory.

Transformative learning focuses on learning-based change that involves 'learning to know,' 'learning to do' , 'learning to live together' and 'learning to be' (UNESCO, 1996 in Makrakis & Kostoulas-Makrakis, 2012). Steps required when following a service-learning strategy as well.

Examples of how ExConTra learning paradigm can merge with service-learning include the following:

- I. Using civic learning to develop learner-centred and self-directed modules.

- II. Provide relevant service using educational material to support students' experiential, constructivist and transformative learning activities.
- III. Providing relevant service that allows learners to brainstorm ideas, negotiate, reflect, peer critique, debate, construct knowledge, and develop action competence.
- IV. Providing relevant service followed by a critical reflection that helps the knowledge construction process through self or group critical reflection.
- V. Fusing learning origins and strategies that incorporate active learning, collaboration and cooperation.
- VI. Engaging students in learning through inquiry-based learning; problem-based learning; higher order thinking; inter/cross-disciplinary learning and authentic learning.
- VII. Acknowledging learners' thoughts, experiences, ideologies and biases, and encouraging them to get involved in dialogue and meaning-making, primarily through student-led online discussions.

There is an imperative need for implementation of ExConTra in pre-service teachers study program.

*“Learning is the process by which a relatively stable modification in stimulus-response relations is developed as a consequence of functional environmental interaction via the senses.”*

is the definition of learning in the work of Lachman (1997). As mentioned by Barron et al. (2015), it is challenging to define learning, but the majority of definitions testify a connection with experience. While most definitions include experience as an active link to the learning notion, it is hard to find a scientific definition of what experience is.

Triliva & Anagnostopoulou (2008) describe experiential learning as an alternative teaching strategy in contrast to the traditional way of teaching (frontal teaching, memorisation).

According to the above studies, experiential learning should not be considered as an “alternative” teaching strategy contrariwise as a teaching strategy aligned to the definition of learning. On the other hand, while learning depends on experience, we should not assume that all experiences will be learned (Barron et al., 2015). The missing element for experience leading to learning is the reflection on the experience (Boud et al., 1985). Reflection is the notion which differentiates service-learning from volunteerism.

## 2.5: Service-learning in teacher education

The European Council policy, since the mid-90s, has included and highlighted, as a new goal for education, to promote democratic citizenship (Karakatsani, 2005). Goals for education should be addressed first to teacher education. Teacher education relates intimately to improvements in K-12 schools (Allam; Wade; Erickson & Anderson in Anderson & Pickeral, 1999). Kalogiannaki & Karras (2006) highlight the importance of the modern “comparative study” of education which prompts us to acquire a new consciousness about pedagogy. Karakatsani (2005) suggests that we require new forms of teacher training, teaching and professional mentality: experiment with new teaching methods, research for different ways of working and creation of broader professional relations. Moreover, she observes that there is a need for active participation in the procedure and practice of democracy, such as the learning and the service of the community (service-learning).

Teacher development toward civic competence requires critical knowledge (Karakatsani, 2005). Research on teacher education over the last two decades reflects a growing focus on reflective teaching (and reflective teacher education) as opposed to a tradition of technical rationality (Kostoulas-Makrakis, 2010). Giroux (1988) writes that the teacher as transformative intellectual must be committed to the following: teaching as an emancipatory practise; the creation of schools as democratic public spheres; the restoration of a community of shared progressive values and the fostering of a collective public discourse linked to the democratic imperatives of equality and social justice.

Civic engagement programs targeted at community service and the acquisition of civic knowledge can be useful if paired with opportunities to engage in service. Of all the programs evaluated, whether experimentally or in correlational studies, those that appeared to have the greatest success, were those that involved both a behavioural and a learning component. Providing a theoretical grounding for the political or community service activities that youths undertake seems to imbue their actions with greater meaning and produce better results (Michelsen, E., Zaff, J. F., & Hair, E. C., 2002).

If we compare the current needs in teacher education to what service-learning can provide us with when integrated into it, we will find many similarities. According to Anderson (1998), service-learning should be into teacher education in order:

- A. to prepare new teachers to use service-learning as a teaching method with their K-12 students;

- B. to help socialize teachers in the essential moral and civic obligations of teaching, including teaching with "care," fostering life-long civic engagement, adapting to the needs of learners with diverse and special needs, and having a commitment to advocate for social justice for children and families;
- C. to enhance preservice teachers' ability to reflect critically on current educational practices and their own teaching;
- D. to develop in preservice teachers the dispositions and abilities needed to easily and fully adopt other educational reforms such as authentic assessment, teaching with integrated thematic units, focusing on higher-order thinking skills, and making improvements in school schedules and climate;
- E. to accelerate the process of learning how to perform a variety of roles needed to meet the needs of students such as counselor, community liaison, advocate, and moral leader; and
- F. to develop human service-oriented teachers who can work effectively in schools with integrated services or other social service settings.

Service-learning appears to have considerable potential as a method to achieve important goals of both K-12 education and teacher preparation (Anderson, 1998).

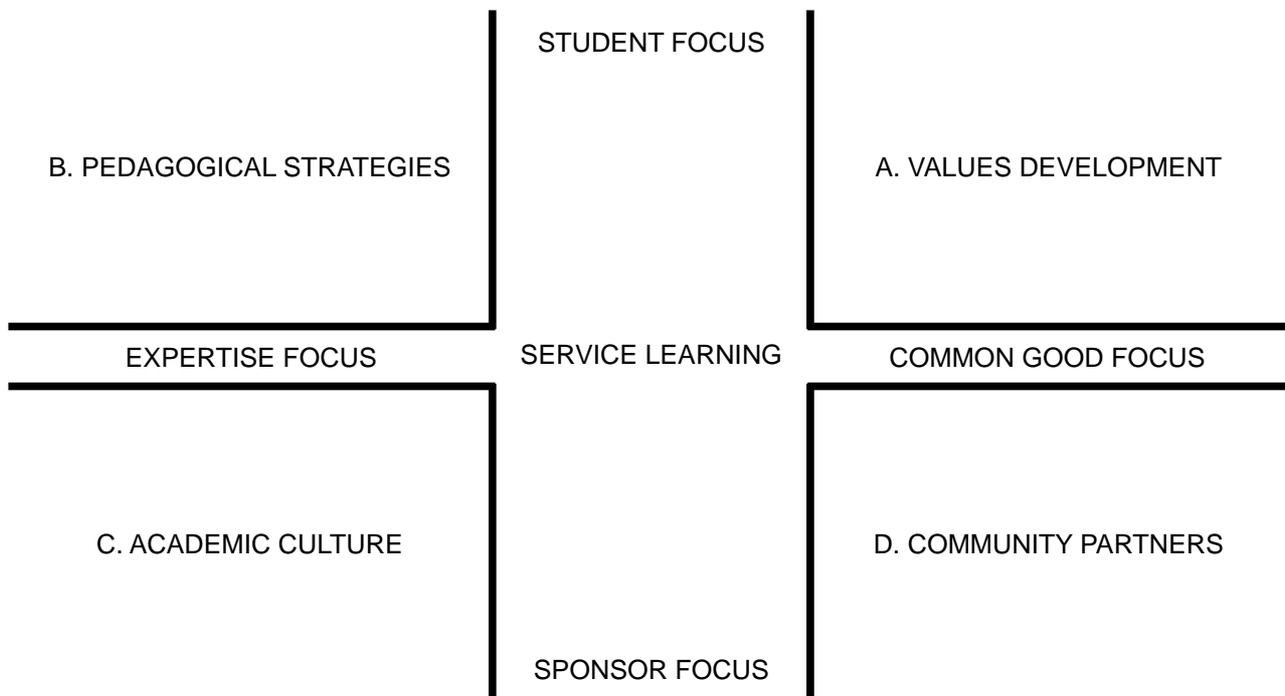
Higher education faculties which include service-learning as a pedagogy for teacher preparation provide their graduates with a dynamic instructional strategy that engages students in meaningful learning and empowers teachers with the skills needed to contribute significantly to broad-based school reform (Myers & Pickeral, 2005). Castellan (2011) also found that the model of service-learning may well be more useful for elementary education majors than the regular model.

Anderson & Pickeral (1999) admit though that there are some barriers integrating service-learning in teacher education, but they support it is worthwhile to increase research in order to overcome them. One common barrier is the lack of time in combination with the overcrowded curriculum, according to Anderson & Pickeral (1999). Teacher education in most countries (as well as in Greece) includes student teaching placements. Erickson & Anderson (2005) argue that we cannot name this as service-learning, but we could transform it to service-learning. The "service" provided by teacher education students often does not address a real need of the K-12 teachers and students with whom they work.

Moreover, most of the times student teachers are not given much input into determining the specifics of their placement. Effective service-learning includes providing the students involved with decision making authority regarding the service they provide. Last but not least, most student teaching placements occur in the context of experiential learning but not one that highlights the creation of an ethos of service (Erickson & Anderson, 2005).

In their research, Anderson & Pickeral (1999) have collected 155 strategies, which creative teacher educators have used to surmount the barriers. They refer to five main themes that emerged from their analysis of these strategies:

- I. *Teacher educators can implement most of the strategies without needing to obtain external funds or even additional internal resources.*
- II. *Teacher educators initial use of service-learning should be on a small scale*
- III. *Teacher educators need to develop a clear understanding of the philosophy and practice of service-learning.*
- IV. *Collaboration is essential for success with service-learning.*
- V. *The creation of supportive policies and infrastructure that align to support effective practice is necessary for success with service-learning. (Anderson & Pickeral, 1999)*



There are many approaches to integrate service-learning in teacher education (Anderson, 1998). According to Caro & Quinn (2011), various forms of service-learning have been researched in teacher education, including direct, indirect, and advocacy. Berger - Kaye (2010) in her

categorization names these service-learning categories (direct, indirect and advocacy) but also includes research as a service-learning category in which students are involved in finding, gathering and reporting on the information in the public interest. Caro & Quinn (2011) suggest the schools of education should be encouraged to search for opportunities that place their students into direct service-learning programs with diverse populations.

Many types of research have been done to find out the benefits of service-learning in teacher education. Researchers have found that when we integrate service-learning in teacher education, the preservice teacher gain: professional benefits as the understanding of Teachers' Work, the development of skills and attitudes for teaching, the readiness to make future career choices, the affirmation of their career choice. A preservice teacher is also able to understand sociocultural aspects such as awareness of their diversity, community understanding and connections, understanding of students with social needs, understanding the role of community groups and volunteers. Preservice teachers engaged in service-learning are interested in future involvement in service-learning. Finally, many of the preservice teachers refer to enjoyment as a benefit from their service-learning experience (Theriot, 2006; Sulentic-Dowell, 2008; Donnison & Itter, 2010; Caro & Quinn, 2011).

According to Anderson & Pickeral (1999), when service-learning was applied to the education of students in Primary Education, it provides valuable assets to the community, students and students' pedagogical knowledge. In addition, research has shown that service-learning can significantly contribute to a more effective education of students Osgood, 2006).

Zlotkowski in Anderson & Pickeral (1999) developed the "Service Learning Conceptual Matrix" to help understand the relationship between service-learning and other concepts in higher education. Although Zlotkowski in Anderson & Pickeral (1999) does not present a strategy to facilitate service-learning integration, the Conceptual Matrix (Fig.4) provides us with a useful tool to understand the conceptual wealth of service-learning, to outline and understand how these basic concepts interact. He believes that the concept of service-learning should combine the concepts of all four quadrants of the Conceptual Matrix for a successful result.

Higher education institutions implement service-learning activities that bring their students' academic benefits. However, many researchers acknowledge that the relationship between these academic achievements, their evaluation and reporting is problematic. (Steinke & Buresh, 2002;

Moore, 1999; Eyer & Giles, 1999; Mabry, 1998; Pritchard, 2002; Troppe, 1995 in Karayan S. & Gathercoal P., 2005).

However, the need for transformation and the current global situation provide the motivation to make changes that will improve this problematic relationship. In order to achieve this, further research is required on designing, implementing, studying and evaluating quality service-learning programs. Service-learning enriches teaching and learning, bridges the gap between theory and the real world, and offers both educators and students the opportunity to engage in research and maintain an active role in their community. Further effective research, evaluation and reporting can help service-learning researchers to provide information on the academic achievements that teachers and other stakeholders seek (Karayan & Gathercoal 2005).

Anderson & Pickeral (1999), analyzed the results of a survey on the application of service-learning, according to Zlotkowski's Conceptual Matrix, and concluded that we have not been able to combine concepts from all four quadrants yet. The same researchers conclude that further research will be needed for successful integration of service-learning into teacher education.

Furco et al. (2010) sum up that the research to date has not been able to confirm a direct relationship between service-learning and academic skills developed in college. They did find, however, that participation in service-learning enhanced prosocial behaviours, both inside and outside of the classroom. The goal as underlined in CSULB (n.d.) is to blend service and learning goals and activities in such a way that the two reinforce each other and produce a more significant impact than either could individually.

There are challenges concerning the integration of service-learning in teacher education, and further research is needed (Anderson & Pickeral, 1999; Karayan & Gathercoal, 2005) but as Osgood (2006) concludes: given the fundamental importance of preparing effective, civic-minded teachers and assuring their rigorous, expansive and intentionally integrative liberal education, it is always worth the effort.

## 2.6: Service-learning enabled by ICTs in an ESD context

### 2.6.1 ICTs and ESD

Sustainability became an issue at the beginning of the seventies while people started to realize that the way we treat the environment could risk the continuity of well being and economic justice (Clugston & Calder in Haddad, 2008). Sustainable development was defined by the World

Commission on Environment and Development (WCED in Kostoulas - Makrakis & Makrakis, 2006) as:

*“the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.*

Kostoula-Makrakis & Makrakis (2006) in their work, explain that one goal of Education for Sustainable Development decade is to enrich curriculums, teaching theory and methodology towards sustainability. Haddad (2008) adds that education should change to meet the needs of sustainability. Citizens and young people should gain knowledge, skills, perspectives and values about sustainability, in order to be able to take over a sustainable lifestyle. In this framework, children’s awareness is the most powerful mean because their system of values and morals will change through the targeted education. The challenge is to educate teachers who can offer those lessons and teach students about sustainable behaviour (Kostoula-Makraki & Makrakis, 2006).

An effective way to integrate ESD in curriculums is what we need. A teaching methodology which can meet ESD priorities. Kostoula-Makrakis & Makrakis (2006) prioritize those needs:

- I. Diversity
- II. Environment
- III. Development

Issues concerning sustainability are not only environmental issues but also interrelated with how humans relate with their natural and social environment and how deep is human’s understanding of oneself and the others (Makrakis, 2012). Sustainability issues need an interdisciplinary approach (McDonald, 2011). Critical pedagogy seems to serve the objectives of Education for Sustainable Development (Kostoula-Makraki & Makrakis, 2006).

Huckle (2011) through an analysis of service-learning definitions, he provides us with a few keywords of the notion:

- awareness
- local and global vision
- responsibility
- learning for change
- participation

- lifelong education
- critical thinking
- decision making
- problem-solving

Most of the notions above coincide with the definition and the results of service-learning. There seem to be an active link for ESD and service-learning.

Service-learning enables students to engage with sustainability (Sultheimer & Pyles, 2011). As Haddad (2008) observes service-learning promotes social change and transformational learning in contrary to the traditional way of teaching. Using service-learning as a teaching methodology, teachers can address inequalities and social injustice by the empowerment of citizens (Taylor, 2007). Haddad (2008) explains that service-learning intends to prepare students as socially responsible citizens and oriented to society needs and international development.

Service-learning can lead to a participatory approach for ESD (Furie, 2003). Haddad (2008) underlines that participatory development and sustainable development are two interdependent notions. Sustainable development cannot happen without the actual participation of those involved. Participatory sustainable development is the future for Haddad (2008). Furie (2003) provides us with the conditions under which service-learning contributes to ESD:

- I. Focus on the community's needs
- II. Participation of the community to acknowledge, design, implement and evaluate the governmental actions
- III. Establishment of effective cooperation
- IV. Acceptance of diversity
- V. Participation of possibly marginalized groups: women, young people, older adults.
- VI. Continuous learning procedures from and towards the community
- VII. Service-learning depends on the interest and cooperation of the community.

Environmental issues have a leading role, and as a result, many communities will promote the notion of sustainability (Marshall-Eames & Brooks, 2011). Service-learning can enrich society with ESD. Similar issues, environmental and social challenges, also exist in universities. Service-learning will promote the connection between universities and local communities and will boost

social interaction (Haddad, 2008). Service-learning in ESD becomes an integral part of being a “sufficient citizen” in a representative democracy (Meter et al., 2012).

In an era that everything happens online, the integration of ICTs in education is a natural outcome. Trucano (2005) points out that because of the urgent for the integration of ESD, the potential benefits of ICT should be discussed. Makrakis (2011) discusses the need for ICT implementation in teacher’s education and underlines the importance of connecting content with context. Principles of pedagogical design should inspire the use of ICT rather than the technologies used (Makrakis, 2011).

Sustainability gives us the chance to rethink the educational procedure. Makrakis (2014a) underlines the need to make a fundamental epistemological change in order to integrate ESD in educational thinking and practice. Integration of ICTs in an ESD context requires a similar approach. It cannot be an add on. The use of ICTs should occur from the context and serve the needs of the content.

Learning in communities is an important aspect of education, according to Huckle (2012). The role of ICTs in building communities of learning is a topic which requires further research. Evoh (2009) studied a few aspects that influence ICTs success, such as: robustness and cohesion of the participating institutions, the readiness of the schools, education capacity building in the area, local and national level and the country’s level of ICTs.

Cooperation is an integral part of service-learning. ICTs can help to make the link stronger and ensure a successful implementation, an ongoing synergy and a compelling presentation of the results.

### **2.6.2 Community of practice**

The topic of the integration of ICT in the pre-service teachers training depends on the educational framework (Raptis & Rapti, 2006). The use of ICT is shaped by the cognitive interests (Habermas, 1972) of the students in the process and also of the wider social and civic context (Kostoula-Makraki & Makrakis, 2006).

An online learning community could be a Virtual Community of Practice (VCoP) where knowledge is produced on prior experiences of people who share the same interests and is being adjusted and shaped collectively (Wenger et al., 2002). Online learning communities can be used to enhance education for sustainability justice. Education for sustainable development should be used interchangeably with Education for Sustainability Justice according to Makrakis (2017). A

participatory video can be a method to reach empathy and an online community of practice can ensure the continuity and augmentation of the effect (Makrakis, 2017).

VCoP is a group of people who communicate with interdependent assignments and have mutual concerns inspired by a common goal (Davenport, 2001). These communities can be used to help teachers reflect on their practices in a collaborative and supportive training setting (Kirschner & Lai, 2007). In such community, members can adjust, share, design and evaluate educational material, experiences, and every element that could add to the effectiveness of the curriculum.

Online social network sites are exemplary communication tools for building knowledge based on communication, collaboration and task sharing (Balasubramanian et al., 2014). Thus, they can be considered aligned with the principles of service-learning and can be matched to empower and multiply the outcomes.

### 2.6.3 Participatory video

Participatory video methodology includes various techniques to involve a group in shaping and producing their film. The idea of creating a video is simple and yet an excellent way of bringing people together to explore issues, voice concerns, or to be creative and narrate stories. Although broadly used, there is not a globally accepted definition as to what forms a participatory video (Roberts & Lunch, 2015).

The term has been used to describe various distinct methods, while some other practices, quite similar to the participatory video methodology, are not described as such. Considering the heterogeneity of existing participatory video methods one network of practitioners (PV-NET, 2008) defined participatory video as:

*“a collaborative approach to working with a group or community in shaping and creating their own film, in order to open spaces for learning and communication and to enable positive change and transformation.”*

To reach a better understanding of what a participatory video is, we can compare it with a documentary-style video. A documentary-style video is finished when the video is finished, but a participatory video is finished when the goal has been reached (Riano, 1994). Roberts (2015) after an extended literature review organises and presents in detail the affordances of participatory video reference (Table 2).

#### Affordances of PV Reference

<b>(a) Reflection</b>	Rewind, replay, edit functions “Video acts as a mirror” Reflection aids conscientisation PV inherently reflexive	Shaw and Robertson (1997) White (2003) Lunch and Lunch (2006) Kyung-HwaYang (2012)
<b>(b) Engagement</b>	Camera a reason for raising issues Creates space for social learning Focuses group deliberation Enables distanciation	Shaw and Robertson (1997) High (2005) Braden and Huong (1998) Braden and Huong (1998)
<b>(c) Dialogue</b>	Develop criticality Develop critical consciousness Collective analysis of social- political-culture structures	Shaw (2012) Benest (2010) Walsh (2012) Braden and Huong (1998) White and Nair 1994
<b>(d) Intent</b>	Builds shared intent for change Collective voice	Braden and Huong 1998 White (2003)
<b>(e) Voice</b>	Provides permission to question A means to identify and articulate issues important to them “Images give power to voice” Production of counter-narratives	Bery (2003), Shaw (2012) Shaw and Robertson (1997) Stuart and Berry (1996) White (2003) Thomas and Britton (2012)
<b>(f) Action</b>	Action for positive change Exerting influence	Benest (2010) Snowden (1984)

**Table 2. Affordances of Participatory Video**

**Source: Roberts (2015)**

Participatory videos are used in different circumstances, projects, and activities. Moreover, researchers implement them as a research methodology, on the basis that participatory videos empower people and communities. (Milne et. Al. 2012).

By including learning material on story recording and broadcasting, students can become empowered to raise their voice, share their stories and to make an active contribution to their integration into the society. Thus, educators should find ways to embrace this entire teaching-learning process. Educators should explore multimodal new literacies. Performance literacy offers interactive learning, empowers the “transformational” process, which stimulates the imagination, creative thinking, language learning and cooperative learning methods. All in all, teachers can function as change agents of reorienting what and how they teach for promoting a key goal for 21st Century education that is, learning to transform oneself and society. (Makrakis, 2012b).

## 2.7: Discussion

Future citizens should be educated to be capable of effectively addressing complex issues. Issues we have not faced yet. Issues we cannot imagine. Education should prepare future active citizens to address the various issues that will arise without knowing the skills they will need. This is a big challenge, indeed. Teaching methodology goes to the forefront. Students need to learn how to learn. Teachers should be trained the way they are expected to teach.

While the academic results in this study appear rationally related to Dewey's ideas of experiential education and the acquisition of knowledge. Several outcomes would not be defined as knowledge acquired according to the philosophers of the literature review (Dewey, Pestalozzi, Freire). Studying the academic results analysed, those that might match include critical thinking, perception, application, and obtaining pedagogical education. What is missing is how the students felt about their service-learning experience. Professional development results of the students included: achieving educational skills & knowledge, succeeding insight into school politics, increasing confidence for teaching, and planning and teaching collaboratively. Personal results indicate that students might have gained experience for themselves, which impacted their leadership skills, confidence, attitudes, and self-worth. Finally, social results imply that students gained knowledge about the world beyond themselves. That fact strengthens their commitment to helping others, their need for cross-cultural communication skills, their sense of civic responsibility. Students tend to become concerned and involved citizens and grow a social justice attitude.

## 2.8: Chapter Summary

Service-learning is a relatively new field for European higher education. In the USA, higher education institutions have separate departments for the promotion of service-learning since the 70s. In Europe, service-learning as a teaching methodology and practice is emerging during the last decade. In Greece, the field is yet unexplored. Service-learning has a vast potential and seems a suitable match to reform education and become an ideal approach to ESD. The service-learning definition is under discussion because the term is used to describe various methodologies. One can find the term service-learning as community-based learning, service-learning, community service and many more. The interchangeability of the term is one more challenge for the research in the scientific area. Review of the literature indicates that service-learning can lead to the knowledge, skills, dispositions, and personality needed to form active citizens. The service-learning potential maximises when the service is significant and long-lasting, reflection is well-facilitated and

structured and the connections explicit. In the current study, service-learning methodology engages the community and uses reflection to activate civic competence. ExConTra learning paradigm enriches service-learning theoretical foundations.

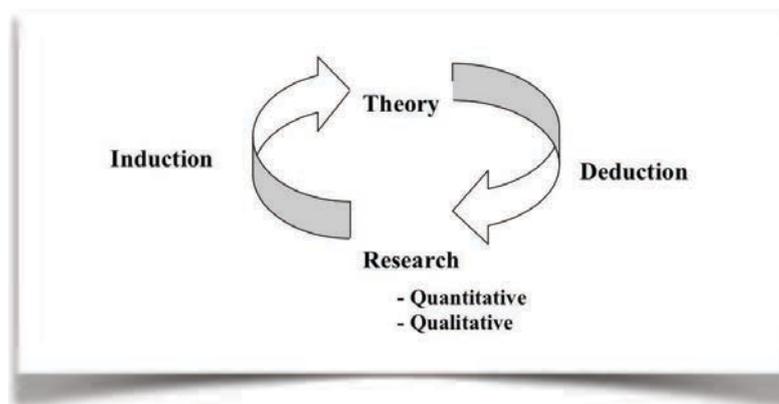
Last decade there is an urgent need to act for sustainable development. Higher education institutions are expected to undergo a critical transformation towards sustainability in their mission and action (Makrakis & Kostoulas-Makrakis, 2015). Higher education reformation requires effective teaching strategies oriented towards education for sustainable development. The reformation of higher education needs high-quality research on teaching strategies as service-learning (Bringle & Hatcher, 2000).

## CHAPTER 3: THEORETICAL FRAMEWORK

This chapter lays out the theoretical framework and justifies the choice of the research methodology. The theoretical framework of the current research is essential to support the selection of the mixed-method approach. The current chapter aims to build the theoretical framework of this mixed-method research. It begins discussing the selected method of the research. Then, it goes on with the rationale behind the mixed-method approach. The next chapter discusses the elements needed for quality research on service-learning. In the end, we discuss the assessment of attitudes and common issues on service-learning research.

### 3.1 The interplay of theory and research

There is a perpetual discussion between theory and research. Steinberg et al. (2010) present in Figure 5. the interplay between theory and research. Scientific research can start at any point of the circle. Research circle can begin with a preliminary theory, which will produce hypothesis to be evaluated through research. Even, researcher's observations can produce theory which will lead us to research.



*Figure 5. The relationship between research and theory*  
*Source: Steinberg et al. (2010)*

In every case, there is a strong link between theory and research. Theory guides the research process and at the same time research validates the theory. The relationship between theory and research is seen as a simultaneous cooperation and competition. The interplay between the two notions provides us with data which is accurate and enable us to formulate theory and research in ways that can have practical implementations. The ontology of the current study is mainly involved with the sustainable human world of interests and interpretations implicit in the SDGs. The epistemological stance promotes knowledge which empowers students to transform their theories and teaching models. Hence, critical constructivism and critical pedagogy are the theoretical aspects

supporting the mix of quantitative and qualitative methods in evaluating the integration of service-learning in teachers' education.

### 3.2 Theoretical framework of the study

The theoretical approach of the current study incorporates a version of realism which recognizes the complexity of social phenomena. That way our approach emphasises the values and the interpretive meaning. Simultaneously, the theoretical framework of this research is accepting explanation as a goal of social research. According to Hall (2013), p.:8:

*“Paradigm issues are a major concern in mixed methods research. Choice of an appropriate paradigm is seen as a necessary step to justify the use of mixed methods. Yet there is still disagreement over what constitutes an appropriate paradigm or paradigms.”*

A realist paradigm includes a contextual evaluation, a process evaluation and an outcomes evaluation. The holistic nature of this realist paradigm makes it the ideal paradigm to deal with the uncertainty and the complexity of assessing attitudes (Norwich, 2019).

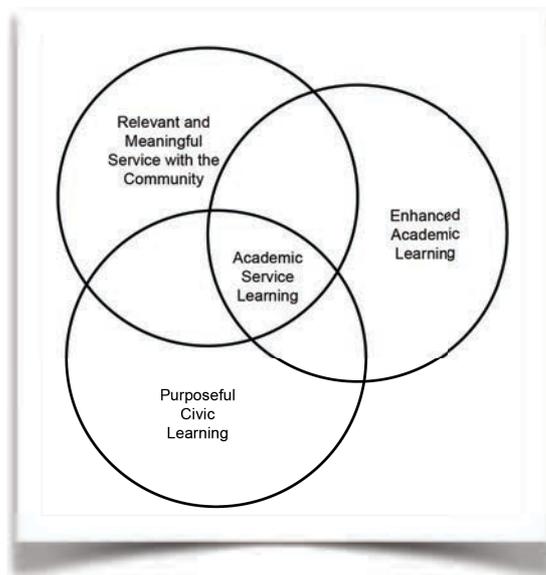
Critical realism guides the theoretical framework of the study and critical pedagogy leads the theoretical framework the courses taught. Teaching strategies are defined as techniques used to help students reach learning objectives. The most frequent teaching strategies used in service-learning are: reflection and dialogue (Stokamer, 2011).

According to CSULB (n.d.), there are four basic principles that should guide the organization and the construction of a service-learning course:

1. Engagement,
2. Reflection,
3. Reciprocity,
4. Public Dissemination

As Astin, Vogelgesang, Ikeda, & Yee (2000) observe in order to create a positive service-learning experience, the student should be interested in the subject matter. Students' interest is a significant determinant of the extent to which (a) "academic" course understanding is improved by the experience, and (b) service is considered as a learning experience. The interest of the objects is a determining factor in the extent to which (a) the experience of the service enhances the understanding of the "academic" course and (b) the service is considered to be a learning

experience. Astin, Vogelgesang, Ikeda, & Yee, (2000) conclude that the core curriculum should include service-learning embedded in various courses.



**Figure 6. Necessary Criteria for Academic Service-learning, Venn Diagram**  
**Source: CSULB, (n.d.)**

Makrakis & Kostoulas-Makrakis (2012), developed an ESD framework which can be a guide for curriculum design and development (Table 3). Learning and behavioural transformation are fundamental for obtaining sustainable thinking and living (learning to live sustainably).

<b>learning to know</b>	This type of learning concerns all the processes and practices that lead people to experience, construct and transform knowledge for making sustainability a mode of life and being.
<b>learning to be</b>	This type of learning concerns all the processes and practices that lead to human self-actualisation, self-understanding, self-regulation and cultivating a sense of being versus having.
<b>learning to live together sustainably</b>	This type of learning concerns all the processes and practices that lead to a peaceful and non- discriminatory society and human co-existence with the natural world.
<b>learning to do</b>	This type of learning concerns all processes and practices that lead to merging knowledge with action for building a sustainable future.
<b>learn to transform oneself and society</b>	This type of learning concerns all the processes and practices to transform their unsustainable values and behaviours and collectively engage to change society towards sustainability.
<b>learning to give</b>	This type of learning promotes solidarity and caring attitudes to meet human needs as learners gain autonomy and purpose for their learning and civic engagement.

**Table 3. Definition of the 21st century pillars**  
**Source: Makrakis & Kostoulas-Makrakis (2015)**

Hence, sustainable living is related to transformative perceptions of learning (Makrakis, 2012a). Transformative learning focuses on a learning-based shift which includes "learning to know", "learning to do", "learning to live together" and "learning to be" (UNESCO, 1996).

It is a shift of consciousness that alters: our way of existing in our world (learning to be), our way of interacting with others by getting to know ourselves first (learning to live together), our way of learning how to learn as well as obtaining, buiding, disseminating and managing knowledge (learning to know) and our way of putting knowledge into action (learning to do). Learning to transform oneself and society has been added by UNESCO as a fifth pillar of learning along with the previous four pillars.

According to the above theories, the subject on which the students will experience service-learning, is of great importance, and so is the service they will do. In the current study, the theoretical framework of the research and the course are aligned. The implemented method allowed students to find a real need of their local community - or of the school community and design an action plan to address the issue. Course design enabled students to create teams, choose their subject and then take action. According to Nikolakaki (2012) group teaching should be the preferred method within a critical pedagogy context in order to reach social justice. At the end of the procedure, students were asked to create digital storytelling to narrate their action.

### 3.3 Hypotheses of the study

The following hypotheses were made:

- 1. There will be a significant difference between students' service-learning scores before and after the completion of the seminars.**
- 2. There will be a significant difference between students' attitude towards change scores' before and after completion of the course.**
- 3. The frequency of student attendance to the course will significantly increase students' service-learning in terms of sensitivity to social issues, intention for social service and development of related personal skills.**
- 4. The use of ICTs will have a significant impact on students' attitudes towards change, satisfaction and self confidence for the course.**
- 5. Students' attitudes towards change, self-confidence and satisfaction will significantly predict service-learning for both the course and the seminar.**

## 3.4 Conducting research on service-learning

Purpose	Focus of Inquiry	Examples of Questions or Information Gathered	Scope of Conclusions
Classroom Grading, Self- assessment	Individual student, faculty, or community member	How did this student perform in my class? What did this student learn? What did I learn from teaching this course?	Specific to the individual student, course, and faculty member
Process Evaluation	Specific course, class, or program	How well was the program implemented? What worked well in this class? How could it be improved?	Specific to that class, course, or program
Outcomes Evaluation	Specific course, class, or program	What could the students do at the end of the course? What was the level of moral development at the end of the program? What were the reading skills of the tutored children?	Specific to that class, course, or program
Qualitative Research	May start with specific case, but then extends across cases, groups of students, multiple classes, courses, or programs	How did faculty integrate civic learning objectives into course syllabi?	Relevant to other (similar) courses, programs, or possibly service- learning in general
Quantitative Research: Correlational	Across groups of students, or multiple classes, courses, or programs	What is the relationship between prior service experience and students' efficacy at the end of a course?	Relevant to other (similar) courses, programs, or possibly service- learning in general
Quantitative Research: Experimental or Theory Testing	Across groups of students, or multiple classes, courses, or programs	Which type of reflection activities (highly structured or unstructured) lead to better student retention of course content?	Relevant to other (similar) courses, programs, or possibly service- learning in general

**Table 4. Purposes of assessment in service-learning education**  
**Source: Bringle & Hatcher, 2001 in Steinberg (2010)**

Research in service - learning has offered us various indications of effective teacher's training, but the majority of pedagogical details are unexplored yet. Further, most research focuses on faculties and students and not on the way of teaching and learning. Last but not least, there are very few data on the field about Greek university education. In an era that Greece suffers from a deep crisis on many levels (economic, social, political), education has the potential to make a significant contribution to the way out of it.

In the research primer on research on service-learning, Steinberg et al. (2010) summarise all forms of assessment, as presented in Table 4. Research and evaluation differ. Research focuses on generating or testing theory.

While an evaluation of a service-learning course can provide us with information about that specific course and its results, research on a course contributes to theory. Theoretical framework, scientific design, reliable and valid measurement techniques, appropriate analysis and generalising beyond the case researched are the elements of a good research (Furco in Steinberg, 2010).

### 3.5 Assessing attitudes

It is important to assess attitudes and motivation when conducting research (Yang & Chang, 2012). There are many definitions of attitudes. Some believe that attitudes are defined as a way of thinking or feeling as evidenced by one's behavior (Jain, 2014). Others indicate that attitudes reflect the internal world of a person, and behavior is a reaction to the external world based on this attitude or belief (Ajzen & Fishbein, 1977). Similarly, Jung (1971) suggests that attitudes inform us whether one is ready to act or react in a certain way. Lastly, Baron and Bryne (1984) report that attitudes are a coupling of behavior and beliefs that are directed toward certain groups, ideas, or people.

Although there are many definitions of attitudes, it is worthwhile assessing one's attitude after certain experiences. Those who critically reflect on experiences are more capable of evaluating whether the experience is justified for the amount of learning achieved (Yang & Chang, 2012). Gauging students' expectations through questionnaires are one way to assess attitudes (Yang & Chang, 2012). Those who demonstrate an interest in the lesson may be more likely to integrate the lesson material into future endeavors. Regardless, assessing student's attitudes can also contribute to modifying the course or lessons to achieve better results for the next course session.

There are certain theoretical frameworks that provide insight into attitudes. According to Vroom, expectancy theory highlights three factors that may explain the reason for attitudes. The three factors include motivation, instrumentality, and valence. Yang and Chang (2012), p.128, state that:

*“motivation is produced by individual expectancy that a certain effort will lead to an intended performance, the instrumentality of this performance achieving a certain result, and the desirability of this result for the individual, known as valence,”*

Many people have different attitudes that may affect their performance during a task, or the likelihood that they will find the experience interesting or worthwhile. Moreover, civic engagement is on the spotlight of higher education due to the growing recognition of the distinctive opportunities for students to cultivate civic values. According to Shuler (2010), research in higher education has suggested connections between participation and attitudes supportive of civic engagement.

The presence of certain attitudes or dispositions will either enhance or impede their capacity to learn materials in an effective manner (Smit, de Brabander, Boekaerts, & Martens, 2017). Notably, it may also affect their willingness to engage with others in difficult discussions or challenge their beliefs related to content embedded within a lesson. Many researchers suggest it is important to determine a student’s self-perceived competence, motivation, willingness, effort, persistence, and interest related to learning new activities (Smit et al., 2017). It is important to establish if students are interested in the content, as disinterest may distract them from the content or make it less likely that they will utilize the material. Thus, many researchers highlight the importance of identifying if a student finds the content valuable to them (Smit et al., 2017). For example, a student identifies a value of being connected to their community and subsequently takes a course on volunteer work. It is important for this student to believe that the content embedded within the course contributes to their value of community connection. If a student does not find the content valuable, it is less likely they will be interested or establish a connection to the content (Smit et al., 2017).

It may be impossible to gauge one’s attitude without inquiring about their experience. Thus, self-report questionnaires are an effective modality to measure these attitudes (Leggett et al., 2016). Although they may be subject to bias and subjectivity it may be useful to use this type of modality to assess attitudes. This study included such questionnaires to explore students’ attitudes towards the principles of service-learning. The purpose of these questionnaires is to evaluate the attitudes among students after engaging in the service-learning activities. For example, Questionnaire no2 evaluated students’ participation in the activity and if they or a family member had ever completed a similar activity in the past. Particularly, students were asked to rate their experience on a Likert

scale from 1 (less interesting) to 4 (more interesting) when compared to other activities they have done for the Department of Education.

According to the literature review, we have concluded to a few assumptions about the expected students' attitudes:

Students preconceptions of service-learning

- 1.1 will match with the service-learning definition,
- 1.2 will match with the service-learning expected outcomes.
- 2.1 will promote students' awareness on social issues and volunteering.
- 2.2 will foster attitudes towards change.
- 2.3 will enable students to show increased belief that they can make changes in their communities.
3. The use of ICT will:
  - 3.1 contribute to understanding the course better,
  - 3.2 help students understand the connection between the content of the course and real-life situations.
4. Service learning will be positively related to:
  - 4.1 students' satisfaction, self - confidence and attitude towards change, meaning that the students who are satisfied, self-confident and willing to change will be more concerned about social issues and interested in volunteering,
  - 4.2 ICT in education.
5. The outputs (participatory videos) will
  - 5.1 enable students to connect theory with practice,
  - 5.2 foster students' belief that their actions can make an impact.

### 3.6 Outcomes and common problems of research on service-learning

Bamber & Les Hankin (2011) synthesis' of the research suggests that service-learning is most effective in generating significant educational outcomes in these cases:

- Students' work aims at a complementary alignment amongst goal, experiences in the community and the classroom, reflection activities.
- The community partnership is collaborative throughout, from initial preparation to fulfilment.
- The experience is integrative, linking what students do in and out of class and relating viewpoints and data from the full spectrum of participants.
- The pedagogy is deliberately planned yet flexible enough so as to support dynamic situations and to respond to capacity-building needs and opportunities for everyone involved.
- Learning and service goals are appropriate and integrated.

Several practitioner-scholars in Felten & Clayton (2011) mention that service-learning potential reaches its maximum effectiveness when it positions students, faculty, and community members as co-learners, educators, and co-generators of knowledge.

As stated by Steinberg et al. (2010), there are some usual problems met in service-learning research. These problems have been taken into consideration in order to avoid repeating them in this research.

Issues in service-learning research, according to Steinberg et al. (2010):

- Small Samples
- Lack of control/comparison groups
- Unrelated theory-knowledge
- Lack of a standard definition of service-learning and other terms
- Metrics are mostly self-reports
- Social prejudice/feasibility
- Lack of generalization
- Selection of "foam" as a sample

## CHAPTER 4: METHODOLOGY

The purpose of this chapter is to introduce the research methodology for this mixed-methods study **regarding the integration of service-learning in a course of Primary School Education Department**. The mixed-method approach allowed for a deeper understanding of service-learning in an ESD context enabled by ICTs.

Of course, there are many appropriate methods for this research. However, in research the choice of the methodological framework stems from the ontological and epistemological beliefs of the researchers. These beliefs define the tools and how they will be used (Makrakis, 2005). The analysis of collected data, according to Strauss and Corbin (1998), is the interplay between the researcher and the data. Both quantitative and qualitative methodological approaches are empirical in the sense that they rely on data from empirical reality (Makrakis, 1998). Burke & Onwuegbuzie (2004) encourage the use of mixed research methods. In their study, they observe that mixed research methods have a long story because researchers often used them even if methodologists had not mentioned it. They conclude that the time has come for the methodology to meet practice and encourage the use of mixed methods. A sheet with all the research data can be found in Appendix B.

This chapter lays out a methodology for the statistical investigation of students' preconceptions about service-learning and students' attitudes towards the principles of service-learning. The results will contribute to education for sustainable development enabled by ICTs.

### 4.1 Overview

This study was conducted over four academic semesters, Fall 2013, Spring 2014, Fall 2014, Spring 2015. The service-learning method was implemented in the courses "ICT in Education for Sustainable Development", "School practice" and the seminars: "06" and "07". The courses were offered at the Department of Education at the University of Crete. The students who participated in "ICT in ESD" were 163 the first academic year, 141 the second and in "School Practice" 23. Students at the University of Crete have the chance to choose if they want to attend seminars offered by their university. The study was also conducted during two of the seminars, seminar 06 and seminar 07. There were 27 students taking part in 06 seminar and 29 students in 07.

The general purpose of this research is **"to investigate the integration of service-learning in a course of Primary School Education Department, in order to give an example of how service-learning could be infused across its study program"**.

Data were collected through open-ended questionnaires at the beginning of the courses and the seminars. An evaluation questionnaire was given at the end of the courses and seminars. Audio data include in-depth interviews with seminars' participants and a focus group discussion, during the final presentation of the results, with the participants of the courses. (Appendix B)

The whole procedure was supported with reflection through group discussions and provision of feedback. A website was created to host a virtual community of practice and present digital storytellings. The address for the website is <http://www.aesop.edc.uoc.gr> (Appendix F). Teachers all over Greece are using the videos of the website, addressing various issues, for educational purposes. In the future, the modified community of practice will be used to engage in-service teachers with the educational material which has been produced.

## 4.2 Research Setting

### **University of Crete**

The study took place at the University of Crete (UOC), a public university on the island of Crete, Greece. UOC has an enrollment of nearly 17.000 students. As Furco et al. (2010) observe, it is essential to many institutions that students graduate with a sense of social responsibility and citizenship awareness. The civic purpose of education is reflected as well, in the UOC mission: "The mission of the University is based on the principles of humanism and aims at cultivating culture both among its members and in society" (Efthimiou, 2000).

The UOC shapes future citizens and aims to empower their democratic behaviour and to cultivate their skills and understanding in order to prepare them to face the contemporary challenges of society (UOC, 2018). According to UOC (2018), it is crucial to transform teachers into change agents for social life and development.

The study took place in the "Sector of Educational Programs, Teaching Methodology and Educational Technology" for two consecutive years (2013-2015). One of the sector's main goals is to evolve and enrich the curriculum UOC (2013).

### **ICT in ESD (Γ03Π10)**

ICT in ESD is a compulsory course which is offered during the fifth semester for the students of the Primary School Education Department at the University of Crete.

The main aim of the course is to develop the required skills and knowledge in order to enable the students to use ICTs in Education for Sustainable Development. Courses in UOC present a wide

area of knowledge, and its scientific reflection, and students attend a three hour class per week with the instructor (UOC, 2013).

The course was offered from UOC during the winter academic semesters 2013-14 and 2014-15. Mr Makrakis was the instructor of the course for both periods and for the purposes of this study in both academic semesters, the teaching method of service-learning was implemented. The outline of the course can be found in Appendix A.

### **Seminars**

Seminars are a course offered in UOC in which, learners, under the guidance of the instructor, investigate a specific topic with the help of relevant scientific literature. The attendance of the seminars is compulsory. Seminars lasted three hours per week. Students can enrol in a seminar after the fourth semester of their studies. Seminars are freely chosen courses, but students must attend at least one to obtain their degree. (UOC, 2013)

#### **Seminar 06: Design and development of teaching material in an online environment and exercises (Γ03Σ06)**

#### **Seminar 07: E-learning - Educational use of the Internet and exercises(Γ03Σ07)**

Both seminars were offered in UOC during the spring academic semester of 2013-14. The seminars' instructor was Prof. Makrakis and service-learning was implemented in combination with the problem-based approach. For the purposes of this study the same outline with the course was used for both seminars (Appendix A).

### **School practice**

According to UOC (n.d.), for the Primary Education Department, School Practice is an integral part of a complete education for future teachers, and it gives emphasis on the proper planning. The aim of School practice is to give students a chance of a first encounter with experiencing school reality and prepare them to practice to organise, implement and evaluate the teaching-learning procedure. School practice is divided into 4 levels. The duration of each level is one academic semester. The students who took part in school practice for the Winter Semester 2013-14 were given questionnaires to explore their preconceptions about service-learning.

### **The researcher**

The researcher worked in primary school education for 10 years and holds a Bachelor in Primary School Education and a Master of Science in ICT in Education. The researcher did not know any of the participants before this study and there is no conflict of interest between the researcher and any of the participants.

### 4.3 Research Methodology

There are several ways to acquire research data. Generally, the approaches used may vary in design and measurement but can be sorted into quantitative and qualitative. Quantitative research focuses on the analysis of documents, objects, words, pictures and many more non-numerical data. The approach is descriptive, interpretative and of subjective nature. In the current study, the quantitative data provided us with useful knowledge that had encouraged numerous of our evaluation decisions. These transformative approaches are, thus, consistent with our vision of turning each student into an active citizen. In that way, service-learning becomes a driving force for building knowledge which can generate critical reflection and action for building a sustainable world. In this context, instead of choosing a particular research paradigm, both can be used. Qualitative and quantitative methods can be complementary in planning and evaluating the reorientation of university curricula towards sustainability.

In this study, a mixed-method approach is used. According to Makrakis & Kostoulas-Makrakis (2015); Steinberg et al. (2010); Trochim (2006) the dichotomy of the two approaches (qualitative and quantitative) is false, at least during the data collection phase. Trochim (2006) explains that even if the researcher chose one of the two methods, there is a big chance that he will end up using both of them. For example, while collecting quantitative data, the researcher might utilise focus groups to explore an idea or clarify a concept. Moreover, while using a qualitative approach, the researcher may need to quantify interview responses into numerical categories. Trochim (2016) concludes that mixing both methods can provide us with better evidence when there is a clear purpose.

A clear rationale and purpose is a prerequisite to ensure the quality of the research. Tashakkori & Teddlie (2010), in the “Handbook of mixed methods in the behavioral and social sciences”, offer us an overall holistic framework (Fig.6) which presents the links of various philosophical approaches. At the edges, there are various philosophical streams and in the middle the respective methodology is presented. In other words for a high quality research you need to choose the way you will study

according the way you think about it. The shape in Fig. 7, presents the connections between the way we think (philosophy) and the way we study (methodology).

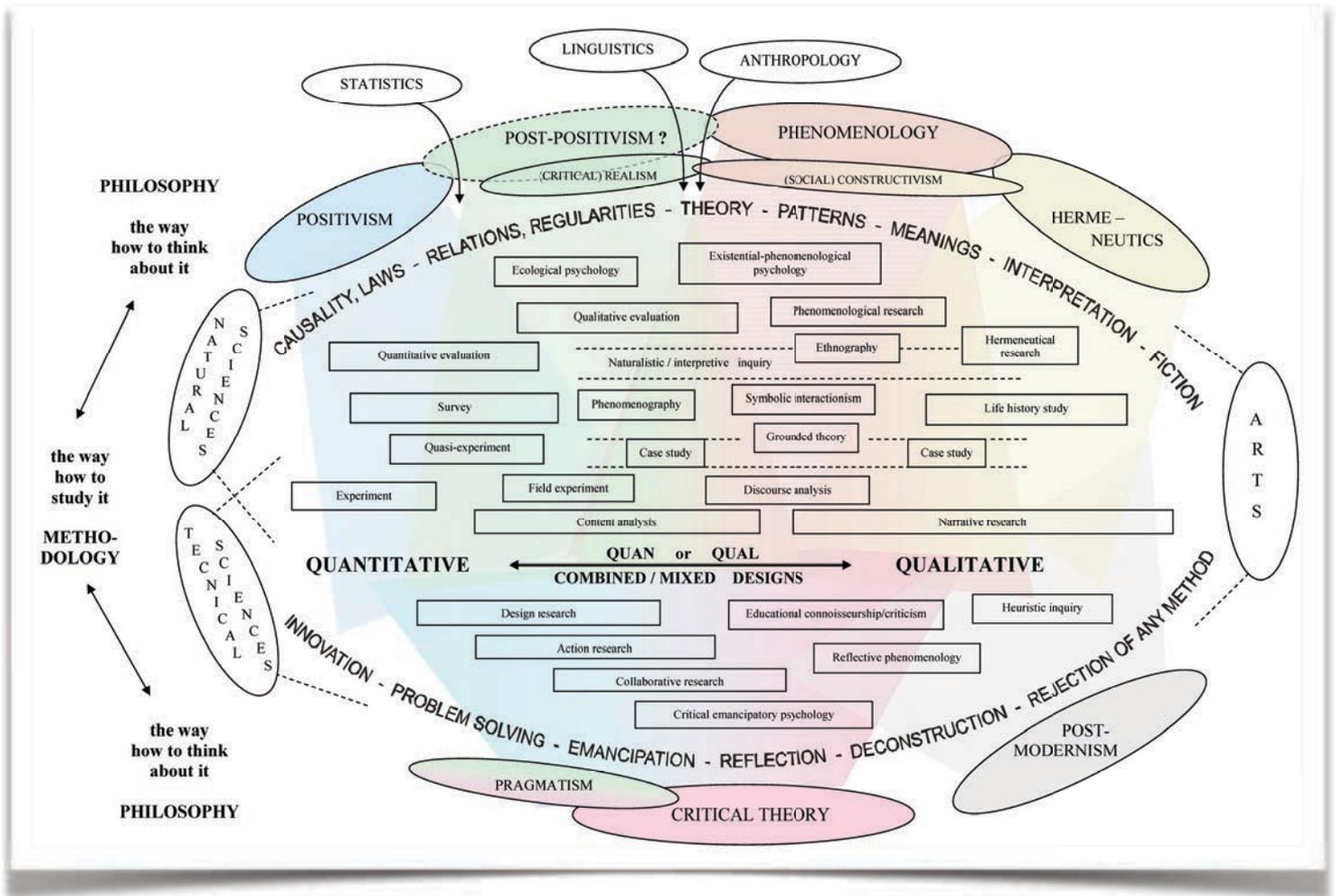


Figure 7. The multidimensional model of research methodology

Source: Tashakkori & Teddlie (Eds.). (2010)

The classical approach to classify mixed methods approach organizes them into two major categories: sequential and concurrent (Creswell et al., 2003). On the one hand, the sequential approach organizes the approach into two periods: in an initial period, either one type of data are collected; then, in a second period, other - data type is collected. On the other hand, the concurrent approach demands that both types of data are collected simultaneously.

According to Terrel (2012) the type of mixed-method approach depends upon four factors:

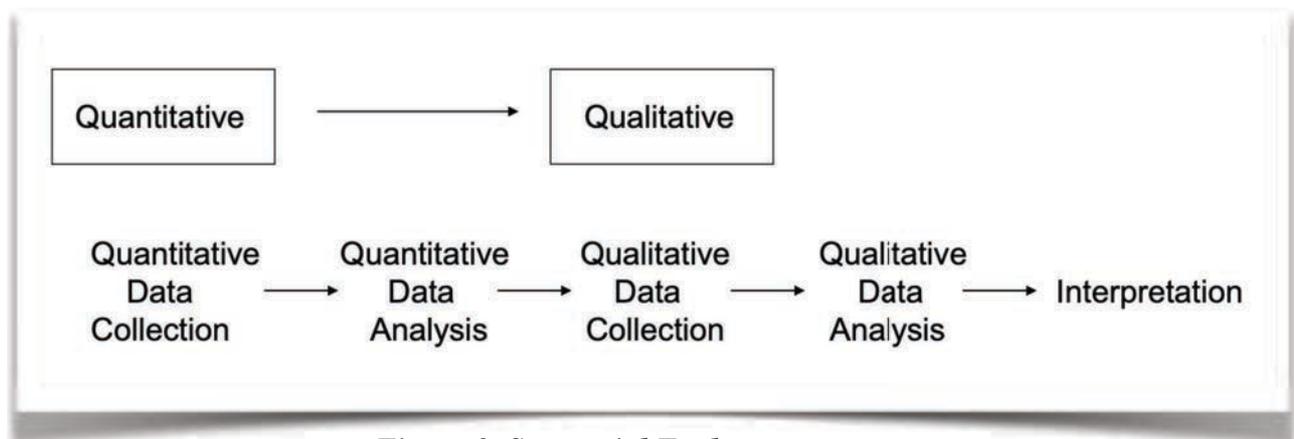
1. Theoretical perspective,
2. Priority of strategy,
3. Sequence of data collection implementation,
4. The point of which the data are integrated.

### 4.3.1 Using mixed-methods approach

Dunning et al. (2008) suggested that mixed-method refers to the approach characterized by the usage of more than one method. In other words, a study relying on both qualitative and quantitative methods, such as the one presented in this paper, is considered to apply a mixed-method approach.

I decided to bring together qualitative and quantitative approach and use a mixed-method, as such an approach had the potential to provide me with a more in-depth understanding of the phenomenon of interest, that being service-learning.

The current research, follows the sequential explanatory strategy. The collection and analysis of quantitative data followed by the collection and analysis of the qualitative data (Terrel, 2012; Almeida, 2018).



*Figure 8. Sequential Explanatory strategy*  
*Source: Terrel (2012)*

Equal priority was given to both phases. Data were integrated during the interpretation phase. The goal number 3 of the research: “to explore attitudes towards the principles of service-learning from participants of the identified course after its completion” required a deeper understanding of the process. We wanted to ensure the explanation of the quantitative results by exploring certain results in a more detailed way using qualitative data. Moreover, it was important to be able to explain unexpected results. According to our prerequisites, the sequential explanatory strategy as presented in Fig.8 was an ideal match.

Combining quantitative and qualitative methods, of course, has both significant benefits and significant drawbacks.

The quantitative method enables one to examine larger samples and cover a wider variety of questions. Moreover, it enables one to quantify the answers and analyze data concerning validity, reliability, and generalizability from the sample to the population. However, though it provides a certain width, the quantitative method does so at the cost of depth. In other words, this method does not provide answers to the “why” questions.

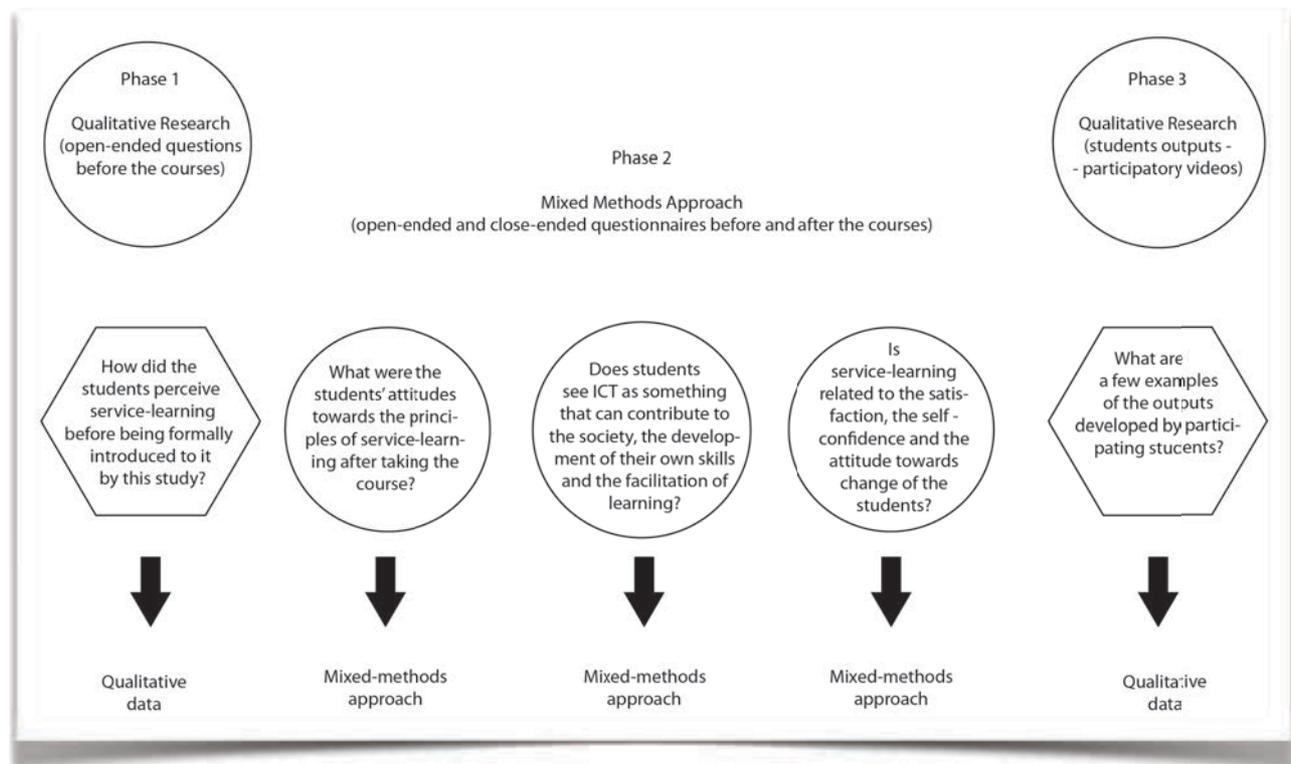
A qualitative method, on the other hand, provides a more in-depth insight and enables one to gain an understanding of the “why”. It adds the meaning to numbers and statistics and enriches our understanding of quantitative data.

Apart from the unique benefits of each method, some benefits emerge from the combination of methods itself. For instance, the mixed qualitative-quantitative design enables one to identify measurement issues, as the same participants are examined by using different techniques (Kelle, 2006). To illustrate the possible measurement issue, I would use an observation from this particular study. Specifically, while analyzing both the quantitative data obtained by using questionnaires and qualitative data obtained by using the interviews, I realized that not every item of the questionnaires was precisely and accurately formulated. In other words, not all items measured what they should be measuring. That is, the data obtained during the interview enabled me to become aware that some questionnaire items might be misleading and thus, should probably be reformulated.

The major drawback of the mixed-method is that it is time-consuming. In other words, although it provides a more comprehensive insight into the subject matter, the mixed-method requires considerable time both for gathering and analyzing the data and integrating and interpreting findings.

Due to all the strengths and weaknesses of both quantitative and qualitative methods, Johnson and Turner (2003, p.299) suggest that these methods should be combined. By combining them, many weaknesses and limitations can be either reduced or completely avoided. Fig. 9 presents the phases of the research and the research method used for each research question.

According to Makrakis & Kostoulas-Makrakis (2015), it is suggested for studies on ESD to use mixed methods. Quantitative data have limitations, and it is hard to approach complex issues using only quantitative measurements. To integrate ESD in higher education, it is crucial to obtain a deep understanding of the procedure. Thus, a wide range of data is needed, and the combination of various research methods and sources is necessary. While Makrakis & Kostoulas-Makrakis (2015)



*Figure 9. Phases of current research*

support that mixed-method approach is highly effective for such studies, they underline the importance of a clear research framework.

In the current study, a mixed-method is used combining quantitative and qualitative data. A separate chapter (Chapter 3) clarifies the theoretical framework of the research and discuss its philosophical approach.

#### **4.3.2 Open-ended questions**

Students from both courses, both seminars and the school practice filled in open-ended questionnaires to provide data for the investigation of their preconceptions about service-learning before the course. The researcher used to analyze the open-ended questionnaires a research procedure which was based on the work of Kostoulas - Makrakis (2005) data analyzing. The procedure consists of the following levels: Coding, Categorising, Classifying, Checking, Comparing, Inferring.

#### **Coding**

All questionnaires were read carefully. Any word or a key phrase that denoted the subjects' perceptions of service - learning was considered as a basic unit of analysis. Additionally, the

frequency of each one was coded into three groups: less frequently (<10%), frequently (10-30%) and very frequently (>30%) (Kostoulas - Makrakis, 2005).

### **Categorising**

Categories were formed for the coded notions. Overall, the studies on service-learning have identified six areas of student outcomes: academic learning and educational success, personal development, social and interpersonal development, ethical and moral development, civic capacity and civic responsibility, career awareness and preparation (Furco, Jones-White , Huesman Jr. and Gorny, 2010). These categories were used. New categories were not formed, since it was not necessary.

### **Classifying**

At this level, we have checked if all the analysis units, words and phrases can be assigned to the above six categories.

### **Checking**

Four raters were asked to distribute the units into the same categories in order to prove consistency. In the current study, four critical friends from different scientific fields were asked to check the distribution. Ratings of the reviewers are presented on the next sub-chapter.

### **Comparing**

There was a comparison in terms of frequency and categories were reshaped. After the comparison, the final categories were shaped.

### **Inferring**

Data analysis provided us in detail the preconceptions of students about service-learning. The relevant research question was answered. **How did the students perceive service-learning before being formally introduced to it by this study?**

#### **4.3.3 Interviews - focus group discussion**

Six seminar participants' were interviewed to provide in-depth data for the mixed-method approach. The aim of the interviews was to interpret the unclear quantitative data **of students' attitudes towards the principles of service-learning**. The stages that were used in this course in order to conduct the interviews are the seven stages that Kvale (1996) in Guion, Diehl, &

McDonald (2012) suggest a researcher should follow when conducting in-depth interviews: thematizing, designing, interviewing, transcribing, analyzing, verifying, and reporting.

### **Thematizing (why?what?how?)**

In an era of crisis, there is an imperative need for change. Change in many fields as well as in education. The web is flooded by articles which all demand or discuss the change in education and many of this support that education is the key to surpass the worldwide crisis (Weimer, 2011; Xinis, n.d.; "Urgent Need for Change in Education Approach," n.d.; Robinson, 2010). Researching innovative new teaching strategies and unfolding new theories for teaching seems to be a one-way solution.

The research was used, predominantly, to verify already existing theories or to develop theory through logical deduction. According to Glaser & Strauss (2009), new theories should be created from the data of the research instead of old corroborating theories. Open-ended questionnaires and in-depth interviews were used in this study for an in-depth understanding of the findings and were analyzed to produce a new theory.

In order to build a theory using the grounded method we need discovery-oriented tools such as in-depth interview. Tools, which allow the interviewer to deeply explore the respondents' opinions and their feelings on a topic (Guion, Diehl, & McDonald, 2012). There was a general interview guide approach, which allowed the flexibility of changing or asking questions based on the responses of the participants (Turner, 2010). This method according to Turner (2010) has some drawbacks such as inconsistency. The researcher might change the way he/she poses the questions. The topic might be explored in depth but not within the same general areas that have been predetermined by the researcher.

### **Designing (plan the design of the study)**

According to Cohen (2006), a semi-structured interview engages interviewer and respondent in a formal interview. There is an "interview guide" which the interviewer follows. Additionally, there is the possibility to change or add questions according to the answers given. In order to use this method the researcher should be prepared well. The participants are free to express their opinion in whichever direction they want, and as a result, we get reliable, comparable qualitative data (Cohen, 2006).

### **Interview (conduct the interview)**

At the beginning of the interview, there was an introduction of the researcher and the purpose of the study. The main aim was to make the respondent feel comfortable. The respondent's permission was asked to record the session. Judgement was avoided, the interviewer used flexibility, patience and observation throughout the procedure. Moreover, as suggested by Guion, Diehl, & McDonald (2012) the interviewers were practising their listening strategies with friends. They were ready to attend the respondents fully, to paraphrase their sayings to confirm the communication and last but not least to reflect their emotions.

Mcnamara (2009) in Turner (2010) recommends that for a successful interview the researcher should follow a few guidelines. Occasionally, he/she should verify if the tape recorder works, ask questions one by one, remain neutral, and encourage responses with active listening. Moreover, the researcher should not take notes if possible, making visible the transitions between significant topics, keeping the control of the interview.

Jacobsson & Åkerström (2012) support that the interviewer should not analyze the interview while it happens. An ostensibly failed interview might turn out to be a successful one once having all the data analyzed.

### **Transcribing (prepare the interview material for analysis)**

The interviews were transcribed. Comments and all the data from the interview guide were included in the transcription in a separate category (Guion, Diehl, & McDonald, 2012).

### **Analyzing (decide on the purpose, the topic, the nature and the appropriate methods of analysis)**

Transcripts will be re-read, and all themes emerging from the respondents' answers will be identified. Topics and questions from the question guide will be used to synthesize the answers to the proposed questions. If answers raise questions, interviews will be repeated (Guion, Diehl, & McDonald, 2012).

### **Verifying (validity of the interview findings)**

The method of triangulation was used to verify the data. Critical friends from different scientific fields, re-read and re-analyze the same set of transcripts and then notes were compared. Moreover, data from interviews were compared with data from closed-ended questionnaires. In case of agreement, information is credible (Guion, Diehl, & McDonald, 2012).

**Report (communicate the findings based on scientific criteria)**

The final stage was to share the results through a written report which will describe the results. The report was used to interpret the quantitative data. (Guion, Diehl, & McDonald, 2012)

**4.3.4 Validity of the qualitative analysis and critical friends**

The subjective nature of qualitative research makes it challenging to establish the validity of the method and the data produced. The current study uses the four criteria for judging the trustworthiness of the analysis: credibility, transferability, dependability and confirmability (Guba, 1981; Korstjens & Moser, 2018).

Credibility and transferability have been accomplished as described above by checking and verifying the obtained data. The researcher had practised her active listening skills before the interviews. The interview protocol (Appendix C.) confirmed the confidentiality of the research data to the participants. The interviews were manually transcribed and coded to ensure a deep understanding of the content.

The dense description of the research methodology is provided to ensure the dependability of the study. While the data of this research will be accessible for five years following the publication, all transcripts and recordings will be recycled afterwards. This causes a possible limitation to the validity of the research in the future.

Another potential limitation of this study was conducting the interviews by Skype versus in person. For consistency reasons, even if proximity to the interviewee allowed for an in-person meeting, a Skype interview was chosen.

All qualitative analysis were checked with the valuable help of four critical friends from different scientific fields. Same tables were given to them and they were asked to perform the same analysis. For example, as presented in Table. 5, each of the critical friends were asked to categorise the notions. There were minor differences in categorisation of results and whenever such a difference occurred the original manuscript from the students was given to the critical friends in order to interpret the result. At the end, the categorisation of all four critical friends and the researchers' matched, except from the two notions, highlighted in bold. Two of the critical friends categorised volunteerism under the personal development category and one of the critical friends categorised action under the civic capacity and civic responsibility category. Similar procedure was followed for all qualitative data. Wherever such differences occurred, they were taken under consideration for the interpretation of the results and the discussion. Critical friends have been informed about the final results.

academic learning and educational success	personal development	social and interpersonal development	ethical and moral development	civic capacity and civic responsibility	career awareness and preparation
acquisition of knowledge (learning/teaching goals)	awareness	respect	reciprocity	active citizen	acquisition of skills
experiential learning	critical thinking (reflection)	cooperation	acquisition of attitude	promoting social change (transformation)	result presentation
alternative teaching/learning method	evaluation	<b>volunteerism</b>	morality	change society	
school - society connection	self-improvement	research		future	
interdisciplinary teaching	<b>volunteerism</b>	anthropocentric orientation		environmental awareness	
culture		social interest		sustainable development	
<b>action</b>		profit for the society (altruistic spirit)		<b>action</b>	
project		solidarity			
		change oneself			

*Table 5. Categorization of the results by critical friends*

#### 4.3.5 Closed-ended questions

The analysis of the closed-ended questions was conducted with the use of SPSS 25 statistical software, to **explore attitudes towards the principles of service-learning from participants of the identified course after its completion.**

The statements from the questionnaires were categorised to synthetic variables according to the theoretical framework. Four critical friends, from various fields, offered their help and re-categorised the data from scratch for a cross check. A few changes were made according to their feedback and the final synthetic variables were created. Four of the synthetic variables which were created represent the service-learning principles according to literature.

Five synthetic variables were created: satisfaction, service-learning, attitude towards change, use of ICTs and self-confidence. The four synthetic variables: satisfaction, attitude towards change, self-confidence and service-learning according to their functional definitions cover all the principles of service-learning.

For the purposes of this study the following functional definitions were given for each synthetic variable. The definitions were extracted from the items which consisted each synthetic variable.

The **Satisfaction synthetic** variable in this research is divided on 3 levels:

1. Self-awareness (knowing your strengths and weaknesses, your prejudices and your biases)
2. Personal skills development (cooperation and communication skills)
3. Experiential learning (connection of knowledge with action, self-action)

The **Service-learning** variable measures student's awareness in relation with social issues, their willingness to volunteer in organisations of public benefit and the development of personal skills as a result of these actions (active citizens).

The **Attitude towards change** variable measures students' readiness to challenge ideas, values and beliefs, to judge and to make subsequent personal and social change.

The **Use of ICTs** variable measures the relevance of new technologies with the facilitation of learning, developing skills and contributing to society.

**Self-confidence** variable measures students' perceptions of whether they can have positive impact and action at the local and/or global level.

(Vigkou & Makrakis, 2014)

Synthetic variables were created for three of questionnaires (Questionnaire no2, Questionnaire no4 and Questionnaire no5). Questionnaire no 2 was answered after the main course (ICT in ESD), Questionnaire no4 (before the seminars) and Questionnaire no5 (after the seminars). All questionnaires included similar questions. Questionnaire no4 was enriched with more questions than the initial Questionnaire no2. Questionnaire no5 included a few more statements since it was given at the end of the course. As a result an extra synthetic variable was created and named: "This course changed me". The synthetic variable "This course changed me" reports students' thoughts upon their transformation as a result of the course.

Data was checked. We recoded eligible items and reliability tests were conducted for all synthetic

variables. Synthetic variables included different items for each questionnaire, thus a cronbach calculated for each questionnaire separately.

Tables 5, 6 and 7 present the items included in each synthetic variable for each questionnaire separately. Cronbach alphas are further discussed in the results chapter.

### Questionnaire 2 - Synthetic Variables

A reliability test, Cronbach  $\alpha$ , was conducted for the Questionnaire no2 of the course: ICT in ESC (two academic semesters).

The alpha coefficient was:

- 0.567 for the synthetic variable, “Attitude towards change”, consisted of 7 variables
- 0.846 for the synthetic variable, “Satisfaction”, consisted of 11 variables
- 0.707 for the synthetic variable, “Self-confidence”, consisted of 6 variables
- 0.729 for the synthetic variable, “Service-learning”, consisted of 10 variables
- 0.754 for the synthetic variable, “Use of ICTs”, consisted of 6 variables

Therefore, we can conclude that all variables had at least acceptable reliability ( $> 0.7$ ), with the exception of Attitude towards change, whose reliability was unsatisfactory.

<b>Attitude towards change (0.567/7 variables)</b>
I enjoy having discussions with people whose ideas and values are different from mine.
I enjoy taking courses that challenge my beliefs and values.
The courses that I enjoy the most are those that make me think about things from a different perspective.
It is crucial to me to develop a philosophy of life which promotes personal and social changes.
While working on a group project, I can easily accept others' criticism of my work.
I learn the course content better when connections to real life situations are made.
My studies in the Primary Education Department should give me more opportunities other than teaching.
<b>Satisfaction (0.846/11 variables)</b>
I enjoyed the course process more than other courses that I have attended.
More courses at my university should integrate service-learning.
Service-learning improved my ability to communicate with my fellow students and “others” related to the course.

The course and the projects I carried out, helped me learn more about myself.
My participation in this course helped me to connect what I learned to real life situations.
I am motivated by courses that contain hands-on applications of theories to real-life situations.
The course allowed me to see my own personal strengths and weaknesses.
The course made me more aware of my own biases and prejudices.
This course enhanced my communication skills.
The course offered me opportunities that allowed me to feel personally engaged in my learning.
I enjoyed the teaching of this course more than other courses that I have attended.
<b>Self-confidence (0.707/6 variables)</b>
The world is run by a few people in power and there is not much the average person can do about it.
I feel that I can have a positive impact on the community in which I live.
I am confident that, through my work, I can help in building a more sustainable world.
I feel that I can make a difference in the world.
I believe that I can have enough influence to impact community decisions.
I feel that I can play an important part in improving the wellbeing of my community.
<b>Service-learning (0.729/10 variables)</b>
I will use service-learning in my future projects.
The use of service-learning is worth the effort.
It is easy for me to neglect my interest for the common good.
It is very important to me to give 3% or more of my income to help those in need.
I would be interested in seeking opportunities for service in organisations or other sectors different from school.
I feel that social problems are not my concern.
Skills and experiences that I gain from community service will be valuable in my career.
Community service and voluntary work will help me develop leadership skills
Providing service to the community is something I prefer to let others do.
I will use service-learning in my future projects.
<b>Use of ICTs (0.754/6 variables)</b>
The creation of the video helped me to understand the connection between course's context and real life situations.
I think that the video I created contributed or it could contribute to the issue or the problem it deals with.

I think that the video I created contributed to developing knowledge and skills which will be useful to me in other situations.
I think that the video I created has contributed to enhancing my understanding of the course material.
Knowing how to use technology makes me feel better integrated into society.
The video I created seems to have contributed to understand the content of the course better.

*Table 6. Synthetic Variables of Questionnaire 2*

#### Questionnaire 4 - Synthetic Variables

A reliability test, Cronbach  $\alpha$ , was conducted for the Questionnaire no4 which was given before the seminars: Γ03Σ06 and Γ03Σ07.

The alpha coefficient was:

- 0.533 for the synthetic variable, “Attitude towards change”, consisted of 15 variables
- 0.593 for the synthetic variable, “Satisfaction”, consisted of 6 variables
- 0.810 for the synthetic variable, “Self-confidence”, consisted of 15 variables
- 0.800 for the synthetic variable, “Service-learning”, consisted of 18 variables

Based on the values of alpha, we can conclude that self-confidence and service-learning had good reliability, whereas the reliability of attitude towards change and satisfaction was unsatisfactory.

<b>Attitude towards change (0.533/15 variables)</b>
I enjoy having discussions with people whose ideas and values are different from mine.
I enjoy taking courses that challenge my beliefs and values.
The courses that I enjoy the most are those that make me think about things from a different perspective.
It is crucial to me to develop a philosophy of life which promotes personal and social changes.
While working on a group project, I can easily accept others' criticism of my work.
I learn the course content better when connections to real life situations are made.
My studies in the Primary Education Department should give me more opportunities other than teaching.
It is OK if some people in the world have more opportunities than others.
I think that people around the world get the rewards and punishments they deserve.

In times of scarcity, it is sometimes necessary to use force against others to get what you need.
The world is generally a fair place.
No one country or group of people should dominate and exploit others in the world.
The needs of the worlds' most fragile people are more pressing than my own.
I think that many people around the world are poor because they do not work hard enough.
Developed nations have the obligation to make incomes around the world as equitable as possible.
<b>Satisfaction (0.593/6 variables)</b>
I am motivated by courses that contain hands-on applications of theories to real-life situations.
I unconsciously adapt my behavior and mannerisms when I am interacting with people of other cultures.
I often adapt my communication style to other people's cultural background.
I am able to communicate in different ways with people from different cultures.
I am fluent in more than one language.
I welcome working with people who have different cultural values from me.
<b>Self-confidence (0.810/15 variables)</b>
The world is run by a few people in power and there is not much the average person can do about it.
I feel that I can have a positive impact on the community in which I live.
I am confident that, through my work, I can help in building a more sustainable world.
I feel that I can make a difference in the world.
I believe that I can have enough influence to impact community decisions.
I feel that I can play an important part in improving the wellbeing of my community.
I do not feel responsible for the world's inequities and problems.
I know several ways in which I can make a difference on some of this world's most worrisome problems.
I am able to get other people to care about global problems that concern me.
I feel comfortable expressing my views regarding a pressing global problem in front of a group of people.
I am able to write an opinion letter to a local media source expressing my concerns over global inequalities and issues.
Over the next 6 months, I will contact a newspaper or radio station to express my concerns about global environmental, social, or political problems.
Over the next 6 months, I will express my views about international politics on a website, blog, or chat room.

Over the next 6 months, I will sign an e-mail or written petition seeking to help individuals or communities abroad.
Over the next 6 months, I will participate in a campus forum, live music, or theater performance or other event where young people express their views about global problems.
<b>Service-learning (0.800/18 variables)</b>
It is easy for me to neglect my interest for the common good.
It is very important to me to give 3% or more of my income to help those in need.
I would be interested in seeking opportunities for service in organisations or other sectors different from school.
I feel that social problems are not my concern.
Community service and voluntary work will help me develop leadership skills.
Providing service to the community is something I prefer to let others do.
I think that most people around the world get what they are entitled to have.
I respect and I am concerned about the rights of all people, globally.
Americans should emulate the more sustainable and equitable practices of other developed countries.
Over the next 6 months, I plan to do volunteer work to help individuals and communities abroad.
Over the next 6 months, I will participate in a walk, dance, run, or bike ride in support of a global cause.
Over the next 6 months, I plan to get involved with a global humanitarian organization or project.
Over the next 6 months, I plan to help people from other countries who are in difficulty.
Over the next 6 months, I plan to get involved in a program that addresses the global environmental crisis.
Over the next 6 months, I will pay a membership or make a cash donation to a global charity.
If at all possible, I will always buy fair-trade or locally sourced products and brands.
I will deliberately buy brands and products that are known to be good stewards of marginalized people and places
I will boycott brands or products that are known to harm marginalized global people and places.

*Table 7. Synthetic Variables of Questionnaire 4*

**Questionnaire 5 - Synthetic Variables**

A reliability test, Cronbach a, was conducted for the Questionnaire no5 which was given after the seminars: Γ03Σ06 and Γ03Σ07. The alpha coefficient was:

- 0.840 for the synthetic variable, “Attitude towards change”, consisted of 19 variables
- 0.736 for the synthetic variable, “Satisfaction”, consisted of 7 variables
- 0.917 for the synthetic variable, “Self-confidence”, consisted of 15 variables
- 0.849 for the synthetic variable, “Service-learning”, consisted of 17 variables
- 0.842 for synthetic variable, “This course changed me”, consisted of 4 variables.

<b>Attitude towards change (0.840/19 variables)</b>
I enjoy having discussions with people whose ideas and values are different from mine.
I enjoy taking courses that challenge my beliefs and values.
The courses that I enjoy the most are those that make me think about things from a different perspective.
I believe that I can have enough influence to impact community decisions.
I learn the course content better when connections to real life situations are made.
My studies in the Primary Education Department should give me more opportunities other than teaching.
It is OK if some people in the world have more opportunities than others.
I think that people around the world get the rewards and punishments they deserve.
In times of scarcity, it is sometimes necessary to use force against others to get what you need.
The world is generally a fair place.
No one country or group of people should dominate and exploit others in the world.
The needs of the worlds’ most fragile people are more pressing than my own.
I think that many people around the world are poor because they do not work hard enough.
Sometimes I doubt the way somebody is doing something and I am trying to think of a better way.
I like to think again about what I'm doing and find alternative ways to do it.
Sometimes I question the way someone does something and try to think a better way.
I like to think again about what I'm doing and find alternative ways to do it.
I often reflect on my actions to see if I could have improved what I did.

I often reevaluate my experiences in order to learn and improve my next accomplishment.
<b>Satisfaction (0.736/7 variables)</b>
It is crucial to me to develop a philosophy of life which promotes personal and social changes.
I am motivated by courses that contain hands-on applications of theories to real-life situations.
I unconsciously adapt my behavior and mannerisms when I am interacting with people of other cultures.
I often adapt my communication style to other people's cultural background.
I am able to communicate in different ways with people from different cultures.
I am fluent in more than one language.
I welcome working with people who have different cultural values from me.
<b>Self-confidence (0.917/15 variables)</b>
The world is run by a few people in power and there is not much the average person can do about it.
I feel that I can have a positive impact on the community in which I live.
I am confident that, through my work, I can help in building a more sustainable world.
I feel that I can make a difference in the world.
I believe that I can have enough influence to impact community decisions.
I feel that I can play an important part in improving the wellbeing of my community.
I do not feel responsible for the world's inequities and problems.
I know several ways in which I can make a difference on some of this world's most worrisome problems.
I am able to get other people to care about global problems that concern me.
I feel comfortable expressing my views regarding a pressing global problem in front of a group of people.
I am able to write an opinion letter to a local media source expressing my concerns over global inequalities and issues.
Over the next 6 months, I will contact a newspaper or radio station to express my concerns about global environmental, social, or political problems.
Over the next 6 months, I will express my views about international politics on a website, blog, or chat room.
Over the next 6 months, I will sign an e-mail or written petition seeking to help individuals or communities abroad.
Over the next 6 months, I will participate in a campus forum, live music, or theater performance or other event where young people express their views about global problems.
<b>Service-learning (0.849/17 variables)</b>

It is easy for me to neglect my interest for the common good.
It is very important to me to give 3% or more of my income to help those in need.
I would be interested in seeking opportunities for service in organisations or other sectors different from school.
I feel that social problems are not my concern.
Community service and voluntary work will help me develop leadership skills.
Providing service to the community is something I prefer to let others do.
I think that most people around the world get what they are entitled to have.
I respect and I am concerned about the rights of all people, globally.
Over the next 6 months, I plan to do volunteer work to help individuals and communities abroad.
Over the next 6 months, I will participate in a walk, dance, run, or bike ride in support of a global cause.
Over the next 6 months, I plan to get involved with a global humanitarian organization or project.
Over the next 6 months, I plan to help people from other countries who are in difficulty.
Over the next 6 months, I plan to get involved in a program that addresses the global environmental crisis.
Over the next 6 months, I will pay a membership or make a cash donation to a global charity.
If at all possible, I will always buy fair-trade or locally sourced products and brands.
I will deliberately buy brands and products that are known to be good stewards of marginalized people and places.
I will boycott brands or products that are known to harm marginalized global people and places.
<b>This course changed me (0.842/4 variables)</b>
I have changed the way I think of myself, as a result of the course.
This course has "shaken" some of my strongly rooted perceptions.
I have changed the way I usually do things, thanks to the course I attended.
During the course I discovered mistakes in things I thought right.

*Table 8. Synthetic Variables of Questionnaire 5*

Based on the alpha values, we can conclude that all variables had good reliability. The only exception was satisfaction, whose reliability was not good (> 0.8), but was still acceptable (> 0.7).

To conclude, the overall reliability of the questionnaires was acceptable. However, the reliability of Attitude towards change in both Qno2 and Qno4 was somewhat below the threshold. Also, the reliability of Satisfaction in Qno4 was unsatisfactory. However, as these questionnaires were constructed for this particular study, and thus were used for the first time, further examination is required to make a more valid conclusion concerning reliability. Synthetic variables and their reliability is being further discussed below (Chapter 4.5).

## 4.4 Procedure

### **Participants**

The participants of the study consisted of the enrolled students of the University of Crete between 2013 - 2015. We collected a total of 707 questionnaires (Appendix B). There were five different types of questionnaires (Appendix D.).

### **Data Collection**

This study used primary and secondary data. All audio data are primary data. Questionnaires are secondary data made available through the course's instructor. Few data were collected as hard copies and other online.

### **DataStorage**

All data was held in the strictest confidence. Online research material were stored on a secure cloud server that was backed up nightly.

Questionnaires were handed in to the students before the beginning of their courses and students were asked to answer them immediately during their course's time. There were also online questionnaires which were sent to students via e-mail and collected within the deadline given. Every student had to fill in the questionnaire as a prerequisite for the completion of the course.

For this study's purposes the following data were gathered (Appendix B):

- 132 questionnaires (Questionnaire no1, in Appendix D.) were given and answered at the beginning of the course ICT in ESD (Γ03Π10), October 2013.
- 163 questionnaires (Questionnaire no2, in Appendix D.) were given and answered at the end of the course ICT in ESD (Γ03Π10), March 2014.
- Focus group discussion was recorded during the final conference for course's results presentation/celebration (Poster in Appendix D.), ICT in ESD (Γ03Π10), April 2014.

- 27 questionnaires (Questionnaire no3, in Appendix D.) were given and answered at the beginning of the seminar “Design and development of teaching material in an online environment and exercises” (Γ03Σ06), February 2014.
- 29 questionnaires (Questionnaire no4, in Appendix D.) were given and answered at the beginning of the seminar “Design and development of teaching material in an online environment and exercises” (Γ03Σ06), February 2014.
- Skype Interviews were conducted at the end of the seminar “Design and development of teaching material in an online environment and exercises” (Γ03Σ06), June 2014.
- 19 questionnaires (Questionnaire no3, in Appendix D.) were given and answered at the beginning of the seminar “E-learning - Educational use of the Internet and exercises” (Γ03Σ07)), February 2014.
- 25 questionnaires (Questionnaire no4, in Appendix D.) were given and answered at the beginning of the seminar “E-learning - Educational use of the Internet and exercises” (Γ03Σ07), February 2014.
- Skype Interviews were conducted at the end of the seminar “E-learning - Educational use of the Internet and exercises” (Γ03Σ07), June 2014.
- 141 questionnaires (Questionnaire no1, in Appendix D.) were given and answered at the beginning of the course ICT in ESD (Γ03Π10), October 2014.
- 47 questionnaires (Questionnaire no5, in Appendix D.) were given and answered at the end of both seminars “Design and development of teaching material in an online environment and exercises” (Γ03Σ06) and “E-learning - Educational use of the Internet and exercises” (Γ03Σ07), July 2014.
- 101 questionnaires (Questionnaire no2, in Appendix D.) were given and answered at the end of the course ICT in ESD (Γ03Π10), February 2015.

#### 4.5 Synthetic variables and their reliability

The quantitative data was analysed with SPSS 25, and the qualitative data was collected simultaneously so a more comprehensive understanding of the concepts of interest could be provided. Out of the total number of 316 participants, 262 participants were engaged in the “ICT in Education for Sustainable Development” course during academic semesters 2013-14 and 2014-15,

whereas 54 participants were engaged in Seminar 06 and Seminar 07. The data was analysed separately for the two groups (ICT in ESD and Seminar 06 and 07). The reason for such a decision was that questionnaires given to participants during ICT in ESD were not completely the same as those given to participants during Seminar 06 and 07.

Collecting quantitative data resulted in the creation of five synthetic variables whose aim was to enable us to understand students' attitudes towards service-learning better. The following variables were created: "Attitude towards change", "Satisfaction", "Self-Confidence", "Service-learning" and "Use of ICTs". Each of these five variables provides us with meaningful information concerning service learning, which is why each of them will be discussed thoroughly, through the analysis of the components of each synthetic variable. However, before proceeding to the further analyses based on the synthetic variables, Cronbach alpha reliabilities for these variables will be presented and discussed. The rationale for discussing the alpha reliabilities at this point is explained in the following section.

### **Interpretation of Cronbach alphas for synthetic variables**

For this study, new questionnaires were created. In particular, some items were taken from the existing instruments and translated, whereas some items were written from scratch. Items taken from existing instruments are combined with newly constructed items, and the combination of these resulted in five synthetic variables. As these synthetic variables are "new", meaning that they were created for this particular study, their reliabilities are yet to be tested.

High overall reliability (Cronbach's alpha) would prove that the components (items) of each variable hold together, while particularly low alphas would suggest that our synthetic variables are not consistent measures of the particular concepts (e.g., service-learning). In other words, getting an insight into Cronbach's alpha coefficients seem to be a prerequisite for making any viable conclusions based on our synthetic variables. In the case of low alpha coefficients, researchers may decide to delete a particular item(s) to improve Cronbach's alpha. However, such a decision has to be justified, as merely deleting the item(s) whenever the alpha is low may harm the validity of the research (Hoekstra et al., 2019). In the current study, no item was deleted. In the case of a low alpha coefficient, instead of deleting items, Cronbach's alpha is used to provide a deeper understanding of the data.

In total, 233 students who attended the ICT in ESD course, answered the questionnaire no2 (132 students in February 2014 and 101 students in February 2015). The questionnaire no4 was answered

by 54 students before attending Seminars 06 and 07 (March 2014) and 47 answered questionnaire no5 at the end of the seminars (July 2014). The Cronbach's alpha coefficients were calculated for each synthetic variable and each questionnaire separately. As one can see from Table 9 (and in a more detailed manner, from Tables 10, 11, and 12), the three questionnaires consisted of similar, but not same items. The difference in questionnaires can be attributed to the differences between a course and a seminar. In particular, some of the questions given to students who participated in the course would not make sense to those who attended the seminar. For that reason, it is not justified to compare Cronbach's alpha across the questionnaires.

	Questionnaire no2	Questionnaire no4	Questionnaire no5
<b>Attitude towards change</b>	0,567 (7)	0,533 (15)	0,840 (19)
<b>Satisfaction</b>	0,846 (11)	0,593 (6)	0,736 (7)
<b>Self-confidence</b>	0,707 (6)	0,810 (15)	0,917 (15)
<b>Service-learning</b>	0,729 (10)	0,800 (18)	0,849 (17)
<b>Use of ICTs</b>	0,754 (6)	-	-
<b>This course changed me</b>	-	-	0,842 (4)

Note: The number of items included in synthetic variable is presented in the parentheses

**Table 9. Synthetic variables' Cronbach's alphas**

One can see from the Table 8 that the majority of alpha coefficients were at least acceptable, meaning that alphas exceeded 0.7 (George & Mallery, 2003). There were three exceptions, or three variables that had questionable reliabilities (alphas  $> 0.6$  but  $> 0.5$ ). In order to see if there were any particular items that contributed to lower reliabilities of these three variables, their reliabilities were further explored by checking item-total statistics (Tables 10, 11, and 12).

As can be seen from Table 10, the reliability of "Attitude towards change" synthetic variable from questionnaire no2 cannot be significantly improved by deleting any of the items. Only deleting the "While working on a group project, I can easily accept others' criticism of my work" item would improve the alpha coefficient of this variable, but the improvement would be rather small. However, it is important to note that the alpha coefficient depends on the number of items. Therefore, when a scale has a small number of items (fewer than 10), Cronbach alpha values can also be quite small (Serbetar & Sedlar, 2016). Although there is a consensus that for reliability to be acceptable, alpha should be higher than 0.7, many researchers do not agree on this. For instance, Hair et al. (2006)

proposed that though the lower limit for Cronbach's alpha value is 0.70, it could also be lower and still be acceptable, especially in the social sciences. Furthermore, Aron and Aron (1999) also discuss that a Cronbach's  $\alpha$  of 0.60 or even lower could be adequate; however, values exceeding 0.7 are preferable (Aron & Aron, 1999).

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I enjoy having discussions with people whose ideas and values are different from mine.	20.27	3.721	.364	.506
I enjoy taking courses that challenge my beliefs and values.	21.05	3.656	.232	.555
The courses that I enjoy the most are those that make me think about things from a different perspective.	20.37	3.677	.309	.522
It is crucial to me to develop a philosophy of life which promotes personal and social changes.	20.42	3.523	.381	.494
While working on a group project, I can easily accept others' criticism of my work.	20.60	3.928	.144	.586
I learn the course content better when connections to real life situations are made.	20.14	3.651	.403	.493
My studies in Primary Education Department should give me more opportunities than teaching.	20.42	3.687	.254	.544

**Table 10. Reliability statistics for “Attitude toward change” (Q2)**

“Attitude towards change” synthetic variable from questionnaire no4 has the lowest alpha (0,533). In this case, we can see that the number of items cannot be the only factor that contributes to the low reliability of Attitude to change, as this variable is consisted of 15 items in questionnaire no4. Table 10 shows that we could slightly improve Cronbach’s alpha if the items: “My studies in Primary Education Department should give me more opportunities than teaching” and “No one country or group of people should dominate and exploit others in the world” were deleted.

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I enjoy having discussions with people whose ideas and values are different from mine.	48.47	8.831	.142	.525
I enjoy taking courses that challenge my beliefs and values.	48.72	8.668	.166	.521
The courses that I enjoy the most are those that make me think about things from a different perspective.	48.51	7.639	.470	.453
It is crucial to me to develop a philosophy of life which promotes personal and social changes.	48.62	8.470	.238	.507
While working on a group project, I can easily accept others' criticism of my work.	48.64	8.350	.189	.517
I learn the course content better when connections to real life situations are made.	48.11	8.987	.094	.533
My studies in Primary Education Department should give me more opportunities than teaching.	48.40	9.167	-.027	.565
It is OK if some people in the world have more opportunities than others.	48.23	8.332	.245	.504
I think that people around the world get the rewards and punishments they deserve.	48.19	8.579	.225	.510
In times of scarcity, it is sometimes necessary to use force against others to get what you need.	48.02	8.865	.145	.524
The world is generally a fair place.	48.11	8.064	.450	.470
No one country or group of people should dominate and exploit others in the world.	48.11	8.718	.064	.549
The needs of the worlds' most fragile people are more pressing than my own.	48.55	7.829	.356	.476
I think that many people around the world are poor because they do not work hard enough.	48.25	8.650	.144	.525
Developed nations have the obligation to make incomes around the world as equitable as possible.	48.43	8.635	.103	.538

**Table 11. Reliability statistics for “Attitude toward change” (Q4)**

When observing items included in ‘Attitude towards change’ synthetic variables, both in questionnaire number 2 and number 4, one can assume that the items do not hold together as not all items necessarily measure the same concept. For instance, some items are more related to *openness* to new ideas, perspectives, and values (e.g., I enjoy taking courses that challenge my beliefs and values), whereas others are related to the sense of justice and morality (e.g., times of scarcity, it is sometimes necessary to use force against others to get what you need). Finally, the item which would increase alphas the most if deleted (in both Q2 and Q4), is “My studies in Primary Education Department should give me more opportunities than teaching”. When deciding to include this item in “Attitudes towards change”, we had in mind that teachers might see primary education as a fruitful field for experimenting, challenging existing and sparking new ideas and values to youth with whom they are working. In other words, we thought that studies in Primary Education Department offer more than merely teaching, as they offer the opportunity to make changes for the better, by developing critical thinking in young people. However, it might be that the students understood this item simply as if studies should enable them to find a job other than being a primary school teacher, in which case this item does not measure the same thing as other items within this synthetic variable. It is essential to note that the further use of the questionnaires we created requires additional examination of their psychometric characteristics. In the case we, or other authors, decide to use these questionnaires for further research on service-learning, we will aim to examine whether “Attitude towards change” is genuinely a unidimensional concept. The recommended way for examining dimensionality is via factor analysis, which would show whether the items of which Attitude towards change is composed have one shared latent factor. This would be particularly useful, and should be repeated with various combinations of items (items included in Q2, Q4, and Q5), as it might provide a better understanding of our alpha values.

“Satisfaction” synthetic variable from questionnaire no4 also has a low alpha (0,593). On Table 12, we observe that there is no an item that we can delete to improve the Cronbach’s alpha of the variable. Finally, the satisfaction variable has also shown good reliability in the case of Q2 and Q5, whereas the reliability was questionable in the case of Q4. Such differences go in line with our recommendation that different combinations of items should be explored, so we can get the most reliable measures of our concepts of interest.

After discussing Cronbach’s alpha reliabilities of all questionnaires, we can close the methodology chapter.

Item-Total Statistics				
I am motivated by courses that contain hands-on applications of theories to real-life situations.	15.81	2.694	.229	.590
I unconsciously adapt my behavior and mannerisms when I am interacting with people of other cultures.	16.21	2.552	.283	.569
I often adapt my communication style to other people's cultural background.	16.23	2.486	.447	.504
I am able to communicate in different ways with people from different cultures.	16.11	2.333	.474	.484
I am fluent in more than one language.	16.15	2.631	.228	.594
I welcome working with people who have different cultural values from me.	15.81	2.579	.346	.542

*Table 12. Reliability statistics for “Satisfaction” (Q4)*

## 4.6 Limitations

During this research, everyone who was involved, strictly adhered to ethical rules. In every research tool used during the survey, the participants took part anonymously to ensure the confidentiality of personal data. This concerns both students and teachers who implemented the intervention. Data encodings or aliases were used to record and present the data. During data collection, as well as educational implementation, special care was taken not to put students into distress by revealing publicly personal data. In the case of oral voice recordings of students, only written transcripts have been used, coded by the speakers' names.

## 4.7 Chapter Summary

Amidst lingering questions about how service-learning can be integrated in higher education study program, this chapter outlined a thorough methodological approach to study the perceptions and the

outcomes of service-learning. The questionnaires that were created offer a large data set to enable the researcher explore the subject in depth. Teaching and learning can be investigated through the data set of this research. Synthetic variables were used to make the understanding clear and the research trustworthy. The outcomes offer a valuable resource about service-learning and experiential education. Transformation of higher education is a long road to haul and this study could contribute to the first steps towards it. The overarching aim is to educate active citizens and make them capable to democratically resolve issues and eventually meet the SDGs.

## CHAPTER 5: RESULTS

The main aim of this study was “to investigate the integration of service-learning in a course of Primary School Education Department so as to give an example of how service-learning could be infused across its study program”. Both qualitative and quantitative data was collected, offering high-quality material for analysis.

The qualitative data (open-ended questionnaires) offered us an in-depth understanding of the preconceptions about service-learning before the course. Moreover, the data obtained during the interviews and focus group discussions were used for the analysis of the outcomes (participatory videos).

The quantitative data of this study helped us to explore attitudes towards the principles of service-learning by checking the hypotheses made. Five synthetic variables which represented service-learning principles emerged from the data: attitude towards change, satisfaction, self-confidence, service-learning, use of the ICT. Detailed information about these principles will not be given again at this point, as they were already defined in Chapter 4 (4.3.4). A sixth variable ensued from the questionnaires that were given after the seminar: “This course changed me”. Quantitative data and the report from the interviews were used to interpret and validate the quantitative data in depth. The current chapter reports and interprets the results.

### 5.1 Students preconceptions of service-learning

Students’ preconceptions of service-learning were measured through open-ended questions. The first step, according to the methodology for the open-ended questions, was coding all the data. Any words or phrases denoting the subjects’ perceptions of service-learning were grouped in tables 4, 5, and 6. The preconceptions were presented through the frequency and percentage with which they were reported. It is important to note that the results were presented separately for the courses: ICT in Education for Sustainable Development 2013 (ESD13), School Practice 2013 (SPA13), and ICT in Education for Sustainable Development 2014 (ESD14).

<b>Service - learning (ESD, October 13)</b>	<b>132</b>	<b>100%</b>
acquisition of knowledge (learning/teaching goals)	15	11%
acquisition of skills	4	3%
action (praxis)	13	10%
active citizen	24	18%

alternative teaching/learning method	4	3%
anthropocentric orientation	7	5%
awareness	4	3%
benefit for the society (altruistic spirit)	37	28%
constructivism (teaching strategy)	9	7%
cooperation (cooperative learning)	51	39%
critical thinking (reflection)	6	5%
dialogue	9	7%
discovery learning	6	5%
empathy	3	2%
environmental awareness	10	8%
experiential learning	22	17%
interdisciplinary teaching	4	3%
interpersonal relationships	3	2%
learner-centered education	30	23%
lifelong learning	7	5%
love	4	3%
moral values	4	3%
mutual assistance	6	5%
non formal education	7	5%
outdoor learning	3	2%
practicing knowledge/skills	4	3%
promoting social change (transformation)	17	13%
project	6	5%
research	3	2%
respect oneself/society	6	5%
school - society interaction	9	7%
self-improvement	11	8%
service/offer help	13	10%

social interest	7	5%
socialization	8	6%
solidarity	24	18%
sustainable development	6	5%
volunteerism	30	23%

*Table 13. Preconceptions on service-learning of the course, 2013*

### **ICT in ESD, 2013**

Prior to the beginning of the course: ICT in ESD (October 2013), students' preconceptions of service-learning were explored. The sample consisted of 132 students. As presented in Table 4 the notions which were repeated more times (above 15%) were: cooperation (39%), benefit for society/altruism (28%), learner-centered education (23%), volunteerism (23%), active citizenship (18%), solidarity (18%), experiential learning (17%). Students from the course (2013) rank cooperation and altruistic spirit as the top service-learning connections. Students from the course (2013) rank as the top service-learning connections, cooperation (39%) and altruistic spirit (28%).

Concerning preconceptions, Helen, who attended ICT in ESD in 2013, says the following about service-learning:

*“learning is a process that is by nature inherently connected with the community each member of the community with his/her behaviour interacts with the rest, and finally he/she has the ability to influence them.”*

Moreover, Kyriaki refers to service-learning as:

*“selfless offering of service in an educational framework.”*

and Maria thinks that:

*“service-learning is a method based on an individual's personality and transforms them to active citizens willing to contribute to society”.*

In other words, students from ICT in ESD 2013 perceived the notion of service-learning as an experiential teaching and learning methodology, which promotes cooperation, has benefits for the society and the learner has a central role in it. Students also connect the notion of service-learning with active citizenship, solidarity and volunteerism.

<b>Service - learning (SPA, October 13)</b>	<b>23</b>	<b>100%</b>
mutual assistance	3	13%
respect	2	9%
cooperation	5	21%
volunteerism	2	9%
sustainable development	1	4%
acquisition of knowledge (learning/teaching goals)	6	26%
acquisition of attitude	2	9%
acquisition of skills	1	4%
active citizen	6	26%
experiential learning	5	21%
alternative teaching/learning method	2	9%
promoting social change (transformation)	4	17%
school - society connection	6	26%
research	3	13%
interdisciplinary teaching	1	4%
awareness	1	4%
solidarity	3	13%
critical thinking (reflection)	6	26%
morality	1	4%
self improvement	1	4%
future	1	4%
culture	1	4%
action	2	9%
profit for the society (altruistic spirit)	7	30%
environmental awareness	3	13%
anthropocentric orientation	2	9%
project	1	4%
evaluation	2	9%

result presentation	1	4%
social interest	2	9%

**Table 14. Preconceptions on service-learning of School practice, 2013**

### **School practice, 2013**

Prior to the beginning of the School practice (October 2013), students' preconceptions of service-learning were explored. The sample consisted of 23 students. As presented in Table 14, School practice students considered service-learning as a teaching strategy which mostly (above 15%) promotes altruistic spirit (30%), knowledge (26%), active citizenship (26%), university-community connection (26%), reflection (26%), cooperation (21%), experiential learning (21%) and social change (17%).

Areti, who attended School practice in 2013, mentions that service-learning is:

*“the kind of learning which is involved in our local communities issues.”*

Georgia notices that service-learning just happens when schools are open to local communities:

*“there was an issue with trash in a village and the teacher decided to design and begin a campaign to inform the residents about recycling”*

Anthi mentions that:

*“This kind of learning describes the bidirectional relation between school and society”*

Many students mentioned cooperation as a necessity for service-learning. As Maria describes:

*“it is crucial to interact with others to reach the common goal”.*

<b>Service - learning (ESD, October 14)</b>	<b>141</b>	<b>100%</b>
acquisition of knowledge (learning/teaching goals)	11	7%
acquisition of skills	4	3%
action (praxis)	9	6%
active citizen	23	16%
alternative teaching/learning method	4	3%

anthropocentric orientation	6	4%
Awareness	4	3%
benefit for the society (altruistic spirit)	8	6%
constructivism (teaching strategy)	11	8%
cooperation (cooperative learning)	63	45%
critical thinking (reflection)	5	4%
dialogue	22	16%
discovery learning	4	3%
Empathy	6	4%
environmental awareness	7	5%
experiential learning	28	20%
interdisciplinary teaching	4	3%
interpersonal relationships	2	1%
learner-centered education	18	13%
lifelong learning	12	9%
love	4	3%
multiculturalism	6	4%
moral values	8	6%
mutual assistance	18	13%
non formal education	2	1%
outdoor learning	3	2%
practicing knowledge/skills	3	2%
promoting social change (transformation)	9	6%
project	15	11%
respect oneself/society	16	11%
school - society interaction	12	9%
self-improvement	12	9%
selflessness	11	8%
service/offer help	26	18%

social interest / social conscience	16	11%
socialization	17	12%
solidarity	46	42%
sustainable development	9	6%
transformative learning	8	6%
volunteerism	44	31%

**Table 15. Preconceptions on service-learning of the course, 2014**

### **ICT in ESD, 2014**

Prior to the beginning of the course: ICT in ESD (October 2014) students' preconceptions of service-learning were explored. The sample consisted of 141 students. As presented in Table 15 the notions connected more often (above 15%) with service-learning were: cooperation (45%), solidarity (42%), volunteerism (31%), experiential learning (20%), service/help (18%), dialogue (16%), active citizenship (16%).

Pavlos, , who attended ICT in ESD in 2013, explains the notion of cooperation:

*“Service-learning copes with education as methodical socialization. It promotes the ability to act collectively.”*

Erato describes how students' altruistic spirit (solidarity) is cultivated:

*“Students will have to discover the need to offer throughout their daily lives.”*

Dora adds the notion of volunteerism:

*“Service-learning copes with learning as praxis, which makes you volunteer for real-life situations. ”*

### **Categorisation of results**

After the above coding of all the data (296 questionnaires), we proceed to categorise the results. The categories used had resulted from the extended literature review of previous research on service-learning.

Students' perceptions were categorised and matched with the categories of service-learning's outcomes, as determined by Furco et al. (2010). The categories with the most notions' attributions are the “Social and Interpersonal Development” category and the “Academic Learning and

Educational Success”. The category named “Civic capacity and civic responsibility” comes next. Table 16 presents the categorisation of students’ preconceptions on service-learning.

academic learning and educational success	personal development	social and interpersonal development	ethical and moral development	civic capacity and civic responsibility	career awareness and preparation
acquisition of knowledge (learning/teaching goals)	awareness	respect	reciprocity	active citizen	acquisition of skills
experiential learning	critical thinking (reflection)	cooperation	acquisition of attitude	promoting social change (transformation)	result presentation
alternative teaching/learning method	evaluation	volunteerism	morality	change society	
school - society connection	self-improvement	research		future	
interdisciplinary teaching		anthropocentric orientation		environmental awareness	
culture		social interest		sustainable development	
action		profit for the society (altruistic spirit)			
project		Solidarity			
		change oneself			

*Table 16. Preconceptions about service-learning*

Students’ perceptions were categorised and matched with the categories of service-learning’s outcomes, as determined by Furco et al. (2010). The category with more responses is the “Social and Interpersonal Development” and the “Academic Learning and Educational Success” follows. “Civic capacity and civic responsibility” comes next. Table 16 presents the categorisation of students’ preconceptions on service-learning.

While interpreting the table 16, I realised that many of the elements mentioned by the students while describing service-learning, are also elements required for the shift towards Education for Sustainable Development. The major shifts which are required to integrate sustainable development into the education curricula are presented in Table 16. In particular, integration of sustainability within higher education implies shifts:

<b>From</b>	<b>To</b>
Transmissive learning	Learning through discovery
Teacher-centred approach	Learner-centred approach
Individual learning	Collaborative learning
Learning dominated by theory	Praxis-oriented learning linking theory and experience
Focus on accumulating knowledge and a content orientation	Focus on self-regulative learning and a real issues orientation
Emphasis on cognitive objectives only	Cognitive, affective, and skills-related objectives
Institutional, staff-based teaching/ learning	Learning with and from others
Low-level cognitive learning	Higher-level cognitive learning

**Table. 17 Major shifts in higher education required to integrate sustainable development (SD), Source: Sterling (2004)**

Students explain this better in the open-ended questionnaires, for instance, Maria describes service-learning as:

*“the type of learning that offers the required skills for effective problem-solving in our daily lives”.*

Overall, students’ preconceptions match with the outcomes of service-learning, as described by the previous research. Their preconceptions highlight certain notions like cooperation, volunteerism and active citizenship, which are already included in service-learning definitions. Besides these three, students consider service-learning to be a learner-centred education strategy which encourages students to reflect upon experiences and learn from them. Besides cooperation, service-learning is seen as a strategy that promotes dialogue, solidarity and altruism. Finally, as already mentioned, service-learning is considered to promote active citizenship, volunteerism, which both can lead to a social change.

## 5.2 Exploring attitudes towards the principles of service-learning

One of the goals regarding this research was **to explore the students’ attitudes towards service-learning after completing the course**. In particular, we wanted to examine what the students realised through their service-learning experience (e.g., whether they feel they the course has helped

them to improved themselves) and whether the integration of service-learning raised students' awareness of social issues and volunteering. Moreover, we wanted to examine if the students were satisfied with the course and whether they believed they could make a difference in their communities.

### 5.2.1 Service - learning and its benefits

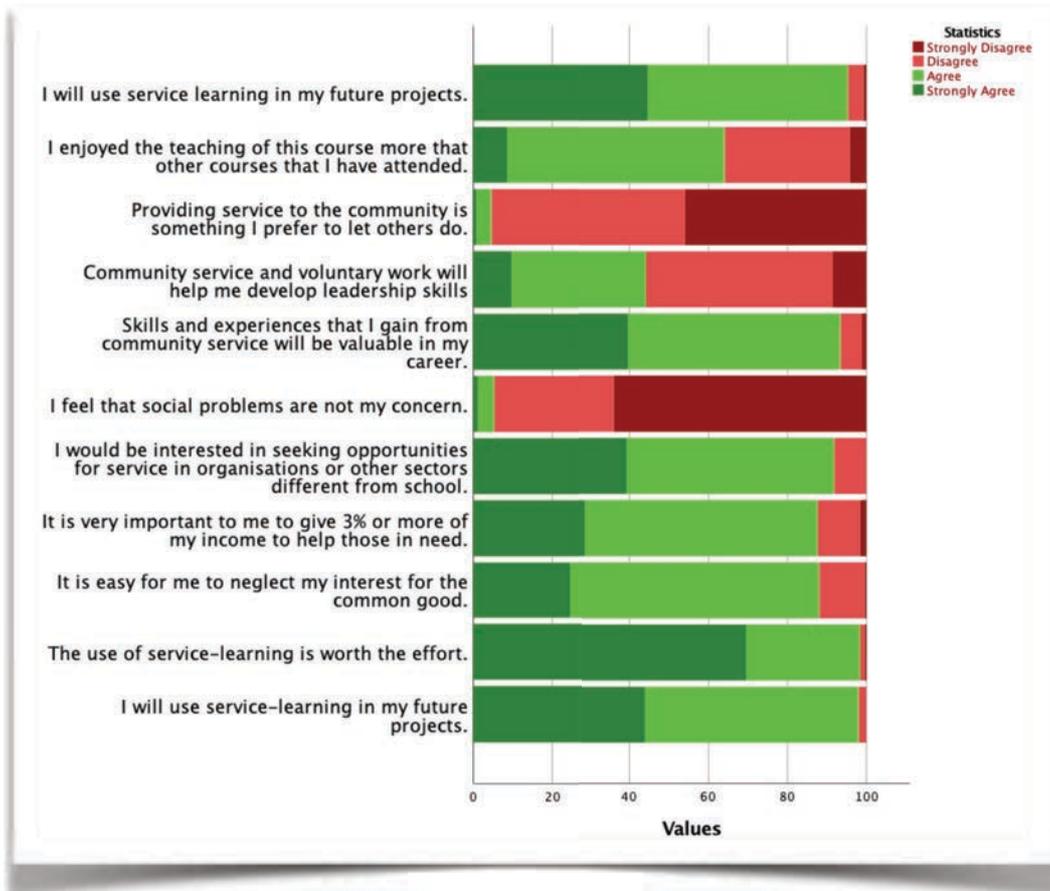
The benefits of service-learning seem to be numerous. However, the following section focuses only on two broad categories – benefits to the community and benefits to students themselves. In particular, benefits to the community are examined through questioning whether service-learning course has raised students' awareness on social issues and volunteering. On the other hand, benefits to students are examined through questioning whether students believe that service-learning helped them acquire new, valuable skills. The first hypothesis was also checked: **“There will be a significant difference between students’ service-learning scores before and after the completion of the seminars.”** As already mentioned, due to the differences in questionnaires, the findings are presented separately for ICT in ESD (2013 and 2014) and seminaria (06 and 07).

#### ICT in ESD - academic semesters 2013-14 & 2014-15

Data was collected by using Questionnaire no2 (Appendix D), through questions with Likert-type scales for answers. The questionnaires were given to and answered by students after the completion of the course ICT in ESD, for two academic semesters (2013-14 & 2014-15). The majority of students were females (87.4%). Descriptive statistics were run on all survey items. In particular, the level of students' agreement with particular items was examined and presented in figures 10, 11, 12, 13, and 14. Marking either Agree or Strongly Agree with the claim was seen as “agreement”. The figures were created using SPSS 25. Qualitative data were used to provide a deeper understanding of the quantitative results.

#### Social issues awareness and volunteering

When asked about their previous volunteer experience, 155 (60.1%) students reported participating in a volunteer action before this course. Moreover, participants were asked what motivated them to participate in those actions. Around half of the participants reported that volunteering was their personal decision (48.5%), whereas 19.5% of participants reported volunteering as part of school/university activities. In addition, a small percentage reported volunteering due to parent's urging (3.4%) or encouragement from civic organisations



*Figure 10. Service-learning*

(3.4%). Concerning service-learning synthetic variable, Figure 10 shows students' agreement with specific claims.

Results have shown that, after completing the course, only 4.6% of participants reported that providing service to the community is something they prefer to let others do. Moreover, only 5.3% of participants believe that social problems are not at all their concern. On the other hand, 91.9% of participants reported they would be interested in seeking opportunities for service in organisations or other sectors different from school. We do not have the data that speaks about participants' interest in seeking opportunities for service in organizations and other sectors before attending this particular course. Therefore, we cannot directly compare the scores from before and after the course and claim it was this course that raised awareness in our students. However, we do know that 60.1% of students reported being engaged in volunteer work before this course.

**Personal skills development**

Regarding the beliefs about developing personal skills, 93.4% of students expressed the belief that skills and experiences gained from community service will be valuable in their career. However,

only 44.2% of them believe that community service and voluntary work will help them develop leadership skills. At first, I found this result unexpected. However, while studying the open-ended questions, I got the feeling that there is confusion with the notion of leadership here.

In the open-ended questionnaire about the benefits of the course we read:

*“I discovered different sides of learning. We were able to focus on issues that influence our daily lives. We had to make decisions for those. Through the whole process we learnt to cooperate and listen to all points of view and to reach a consensus.”*

*“This course enriched my knowledge on several issues and made me realise that learning should be supported by service and interaction of citizens.”*

*“Learning cannot be passive. We have to take action to learn. To take control of our own learning.”*

Moreover, we read about the educators' role:

*“Educators should have the role of a coordinator and he/she should not be considered as a leader”.*

*“An educator should promote active involvement of students in their own learning and the “authority” mode should be abolished.”*

*“The educator has the role of the mediator. It is an extremely difficult task because he/she has to abandon the “authority” of his desk.”*

Overall, it seems that the students were satisfied with the service-learning. In particular, 98.5% of students reported that the use of service-learning is worth the effort. Finally, 98.1% of students reported they would use service-learning in their future projects.

### **Seminars 06 and 07 - academic semester 2013-14**

#### **Social issues awareness and volunteering**

In order to further examine whether the integration of service-learning has raised students' awareness of social issues and volunteering, a questionnaire with more service-learning-related questions was given to students who attended seminars 06 and 07. The advantage of the data collection process which took place during seminars 06 and 07 (over the one that took place during ICT in ESD) is that participants completed questionnaires both before and after the seminar. That

means that we were able to compare their scores on service-learning and see if there was any significant change in scores.

However, this phase of data collection also had one significant drawback. Specifically, 54 participants completed the questionnaires before the course, and 46 participants completed the questionnaires after the course. Nevertheless, the identification numbers were noted correctly for only 29 participants, and not all of the 29 students had paired data for service learning. In particular, only 23 students had scores on both pre and post-seminar service-learning synthetic variables. Therefore, the descriptive statistics were based on all cases (54 for pre-seminar, and 46 for post-seminar), whereas a direct comparison of service-learning total scores was conducted only on students for whom we had paired data (23 students).

Out of the 46 participants who completed the questionnaire after the course, 89.1% were females. Moreover, 50% of participants reported participating in a volunteer action before attending this seminar. As in the case of ICT in ESD, the majority of students reported that past volunteering was their personal decision (41.7%). The second most frequent reason was that volunteering was a part of the school activities (19.6%). Two participants reported volunteering due to parents' encouragement (4.3%), or the encouragement from a civic organisation (2.2%).

Descriptive statistics has shown that the percentage of students who reported being concerned about the rights of all people as well as planning to engage in different actions to help other people or environment was in general higher after the seminar than it was before it. Of course, there were some items for which the percentage was higher before the seminar. However, when interpreting the differences in percentages of agreement before and after the seminar, one has to keep in mind the small sample sizes. For instance, the statement "I respect and I am concerned about the rights of all people, globally" received the higher percentage of agreement before than after the seminar. Yet, if one pays attention to the frequency (n) instead of percentage, one can see that there were only two people who did not agree with the statement, both before and after the seminar. Moreover, with such small samples, one or two randomly answered questions can make a difference. Thus, although detailed information regarding students' agreement with particular service-learning related statements is shown in the Table 18, the interpretation of difference between "before" and "after" should not be based on differences within each particular item. Instead, the interpretation should be done on the basis of all items taken together as a whole. Finally, as already mentioned - when taken together as a whole, descriptive statistics suggests that more students reported they plan to engage in actions to help other people or environment after the seminar than before it.

Statement	Before seminar		After seminar	
	n (of 54)	%	n (of 46)	%
I would be interested in seeking opportunities for service in organisations or other sectors different from school.	52	96.3	42	91.3
I feel that social problems are not my concern.	54	0	4	10.8
I respect and I am concerned about the rights of all people, globally.	54	100	44	95.6
Over the next six months I plan to do volunteer work to help individuals and communities abroad.	16	29.7	25	54.3
Over the next six months I will participate in a walk, dance, run or bike ride in support of a global cause.	28	51.9	30	66.6
Over the next six months I plan to get involved with a global humanitarian organization or project.	29	54.7	34	73.9
Over the next six months I plan to help international people who are in difficulty.	34	63	29	64.5
Over the next 6 months, I plan to get involved in a program that addresses the global environmental crisis.	33	61.2	28	63.6
Over the next 6 months, I will pay a membership or make a cash donation to a global charity.	27	50	29	64.5
If at all possible, I will always buy fair-trade or locally grown products and brands.	50	94.4	46	100
I will deliberately buy brands and products that are known to be good stewards of marginalized people and places.	48	90.5	42	91.3
I will boycott brands or products that are known to harm marginalized global people and places.	47	88.7	46	100

Note: n – number of participants who agree with the statement

**Table 18. Percentage of students who agree with particular service-learning related statements**

Studying the results presenting on Table 18, we notice that the seminar definitely had an impact on students' opinions and future actions. It is interesting that students' percentage who want to volunteer increased, as well as the percentage of students' who want to get involved with a global humanitarian. The "over the next six months" plans of the students improved and that seems to be a result of the seminars they attended. Although it provides us with the above interesting insight about students' awareness on social issues and volunteering before and after the seminar, descriptive statistics does not tell us whether the change in students' responses was significant. First, as already mentioned, descriptive statistics for pre- and post-seminar phase was not based on the same individuals, and this prevents us from making a direct comparison. Second, even if it was based on the same individuals, descriptive statistics does not speak about statistical significance. In other words, it does not tell us whether the change in service-learning was statistically significant.

In order to examine whether the change in service-learning scores obtained before and after the seminar was statistically significant, paired-sample t-test was applied. As mentioned above, this direct comparison was done on service-learning total scores, and only on those individuals for whom we had service-learning scores on both pre and post-seminar measures. Results have shown that there was a significant difference between the scores ( $t(22) = -3.978, p < .01$ ). In particular, results have shown that there was a significant increase in service-learning from before the seminar ( $M = 2.91, SD = .27$ ) to after the seminar ( $M = 3.28, SD = .57$ ). The service-learning total score is based on items that speak about awareness of social issues and engaging in actions to address them. Our first hypothesis was confirmed: **"There was a significant difference between students' service-learning scores before and after the completion of the seminars."** In other words, students' awareness of social issues and engagement in related actions was increased after the completion of the seminars.

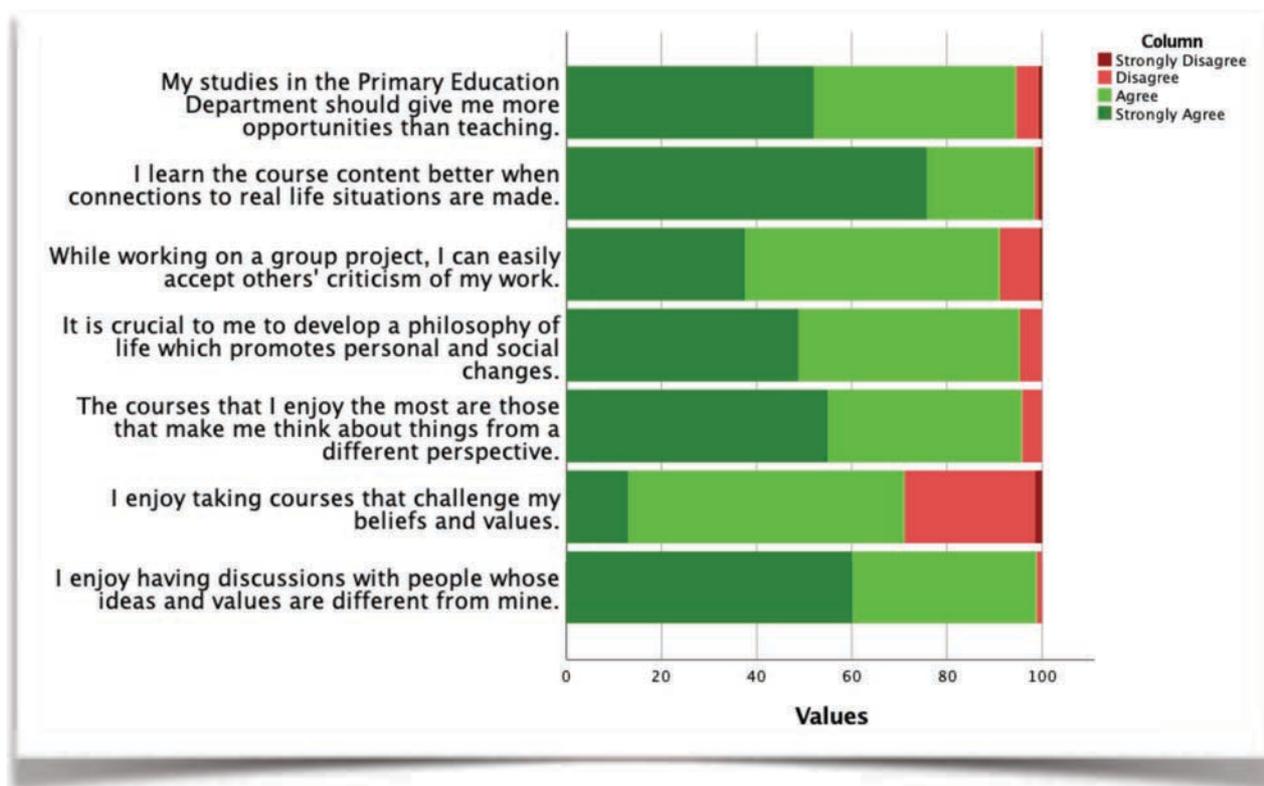
	Before the seminar		After the seminar		t
	M	SD	M	SD	
Service-learning	2.91	.27	3.28	.57	-3.978**

\*\* p value is significant at .01 level of significance

*Table 19. Service-learning scores obtained before and after the seminar*

## 5.2.2 Attitude towards change

## ICT in ESD (2013 &amp; 2014)



*Figure. 11 Attitude towards change*

In order to explore what were our students' attitudes towards changes in a more detailed manner, the components of synthetic variable: "Attitude towards change" are presented (Figure 11).

As it can be seen from Figure 11, the percentage of agreement for the majority of items exceeded 90%. The only exception was the item "I enjoy taking courses that challenge my beliefs and values" (percentage of agreement being 71.2%). However, a slightly lower percentage of agreement on this particular item may not necessarily mean that students are not open to change and challenges, but rather that the procedure of challenging one's beliefs and values is not always enjoyable. Despite the fact that students might not enjoy the "process of change", they are ready to accept criticism (91.1%) and have discussions with people whose ideas and values are different from their own (98.9%). Furthermore, the students reported they enjoy courses which make them think about things from a different perspective (agreement 95.8%). Finally, they reported that developing a philosophy of life which promotes personal and social changes is crucial for them (agreement 96.5%).

In line with my belief, during the presentation that took place at the end of the course, there was the focus group discussion and a student explained:

*“We concluded that making changes is our main responsibility as educators. We are the ones who should inspire students to transform to change agents.”*

### **Seminars 06 and 07 - academic semester 2013-14**

Our second hypothesis was: **“There will be a significant difference between students’ attitude towards change scores before and after completion of the seminars”**. To examine whether a significant change in attitudes towards change scores has occurred during the seminar, scores obtained before and after the course were compared using the paired-sample t-test. The comparison was done on attitude towards change total scores, and only on those individuals for whom we had scores on both pre and post-seminar measures. Results have shown that there was no significant difference between the scores ( $t(26) = -0.040, p > .05$ ). The scores obtained before ( $M = 3.49, SD = .20$ ) and after the seminar ( $M = 3.50, SD = .26$ ) were roughly equal. In other words, according to the results, it seems that the course did not increase the positive attitude towards changes in our students. Our second hypothesis was not confirmed: **“There was not a significant difference between students’ attitude towards change scores before and after the completion of the seminars.”**

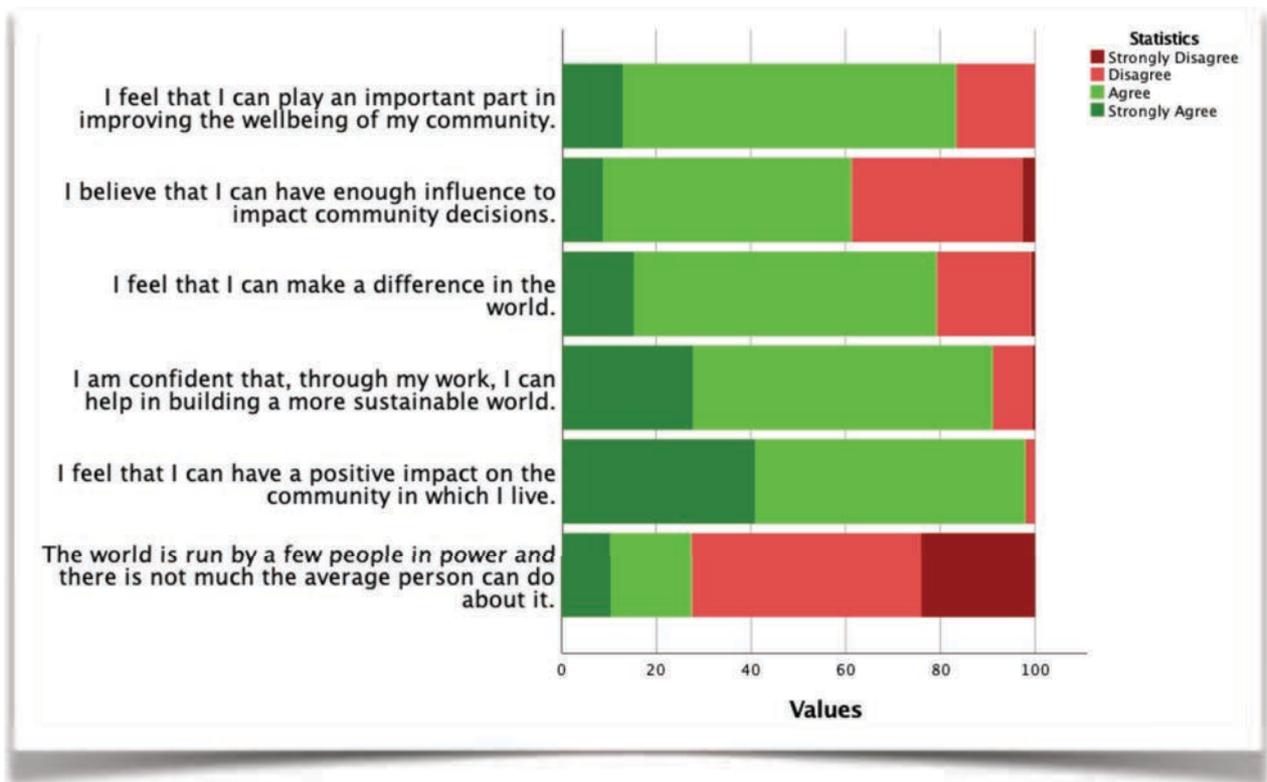
	Before the seminar		After the seminar		t
Attitude towards change	M	SD	M	SD	
	3.49	.20	3.50	.26	-0.40

*Table 20. Attitude towards change scores obtained before and after the seminar*

### **5.2.3: Self-confidence**

The previous section has shown that students do have a positive attitude towards changes. Yet, do students believe they are, indeed, capable of making changes? Are the students confident about making a difference in their communities? This question was one of the questions we aimed to answer within the chapter **5.2 - exploring student’s attitudes towards the principles of service-learning**.

To explore students’ self-confidence, the synthetic variable “Self-confidence” was explored in a more detailed manner. In particular, we presented and interpreted students’ agreement with the components of Self-confidence synthetic variable (Figure 12).



*Figure 12. Self-confidence*

Two of the variables reported rates of agreement above 90%. Students reported feeling that they can have a positive impact on their local communities (98.1%) and they are confident that, through their work, they can help building a more sustainable world (91.3%). Somewhat lower percentage of agreement was obtained for the item “I believe I can make a difference in the world“(79.3%), and the item “I believe I can have enough influence to impact community decisions” (61.3%). Moreover, one observes that students believe they can have a positive impact on their communities (98.1%). Yet, when it comes to the impact on community decisions, only 61.3% of them agree. This can potentially be related to the statement “The world is run by a few people in power, and there is not much the average person can do about it”, with which 27.5% of student agreed. Open-ended questions provided an additional insight by showing that there are ups and downs when it comes to self-confidence. For instance, Marina describes:

*“A happy incident was that we felt active and able to change the world, while a sad incident was the fact that in most cases, the problems and the amount of difficulties made us feel that all the effort was pointless and nothing will change. Luckily, this feeling lasted only for a moment or two!”*

## 5.2.4 Satisfaction

## ICT in ESD

Course-related behavior and opinions	N	%
<b>Attendance</b>		
Less than 5 lectures	20	7.6
6-9 lectures	131	50.0
10-13 lectures	111	42.4
<b>Interest</b>		
Less interesting	5	1.9
About the same	51	19.5
Interesting	153	58.6
More interesting	52	19.9
<b>Participation</b>		
Less than other courses	5	1.9
About the same	27	10.4
A little more	76	29.3
More	151	58.3
<b>Theory and practice connection</b>		
Less than other courses	2	.8
About the same	34	13.0
A little more	99	37.9
More	126	48.3
<b>Learning</b>		
Less learned	4	1.5
Learned about the same	56	21.5
Learned a little more	107	41.0
Learned more	94	36.0

*Table 21. Course-related behaviour and opinions*

Students were asked about their behaviour and opinions in relation to ICT in ESD course. In particular, they were asked about attendance, interest, participation, and learning. The course was well-attended, with 50% of participants attending between 6 and 9 lectures during the course, and 42.4% attending between 10 and 13 lectures. Moreover, the majority of participants found the course to be interesting (59.6%), or more interesting than other courses (19.9%). Not only the participants were interested in this particular course, but the majority of them (87.6%) also reported participating in the course more that they participated in other courses.

Moreover, 86.2% of participants reported that this course integrated theory and practice more than other courses. Finally, 77% of them said they had learned a little more or more than during other courses. A detailed description of participants' answers is presented in Table 21.

### Course attendance

Our third hypothesis was: **“The frequency of student attendance to the course will significantly increase students’ service-learning in terms of sensitivity to social issues, intention for social service and development of related personal skills.”** In order to check this hypothesis, we examined the effect of course attendance. This was done due to the desire to examine if the attendance to the course had the power to boost service-learning in students.

In order to examine whether there was a difference in service-learning between the students who attended the course regularly (10-13 lectures), attended it sometimes (6-9 lectures), or attended it rarely (less than 5 lectures), One-Way ANOVA was applied.

Before conducting the ANOVA itself, Levene’s test of homogeneity of variances was applied. Results have shown that the groups were not homogenous ( $F(2,252) = 5.508, p < .01$ ), thus, Welch ANOVA was applied instead of a regular One-Way ANOVA.

	F	df1	df2	p
Welch	5.177	2	46.914	.009

**Table 22. Welch ANOVA for course attendance**

(I) Course attendance	(J) Course attendance	MD (I-J)	SE	p
Less than 5 lectures	6-9 lectures	-.299	.115	.044
	10-13 lectures	-.355	.115	.015
6-9 lectures	Less than 5 lectures	.299	.115	.044
	10-13 lectures	-.056	.039	.336
10-13 lectures	Less than 5 lectures	.355	.115	.015
	6-9 lectures	.056	.039	.336

**Table 23. Course attendance**

Results have shown that there was a significant difference between the three groups (Table 22). To see which groups differed significantly Games-Howell post hoc tests were conducted. We opted for Games-Howell particularly, as it accompanies Welch ANOVA. Results have shown that there was a significant difference in service-learning between those who rarely attended the course and those who attended it sometimes or regularly. However, there was no significant difference between those who attended it sometimes and regularly (Table 23). The third hypothesis was partially confirmed: **“The frequency of student attendance to the course significantly increased students’ service-learning in terms of sensitivity to social issues, intention for social service and development of related personal skills.”** In other words, students who attended less than 5 lectures were less sensitive to social issues and to had less possibilities to take action related to those issues, compared to students who attended 6-9 and 10-13 lectures.

#### **Seminars 06 and 07 - academic semester 2013-14**

Students were also asked about their behaviour and opinions in relation to the seminar. Results are comparable to those obtained on the data from the ICT in ESD course. In particular, the majority of participants found the course to be interesting (56.5%), or even more interesting than other courses (30.4%). Moreover, as in the case of ICT in ESD, around 90% of participants reported participating in the course a little more or more than they participated in other courses. In the case of learning, 84.8% of participants reported learning more during this course than during other courses. The only bigger difference in responses obtained during ICT in ESD and seminar 06/07 was found for the integration of theory and practice. Contrary to ICT in ESD, where 86.2% of participants reported

that the course integrated theory and practice better than other courses, 73.9% of participants reported that during seminars 06/07. This can be explained since seminars' structure encouraging the connection of theory and practice. On the other hand, the courses offered tended to be more theoretical. A detailed description of participants' answers is presented in Table 24.

<b>Seminars-related behavior and opinions</b>	N	%
<b>Interest</b>		
Less interesting	1	2.2
About the same	5	10.9
Interesting	26	56.5
More interesting	14	30.4
<b>Participation</b>		
Less than other courses	-	-
About the same	4	8.7
A little more	19	41.3
More	23	50.0
<b>Theory and practice connection</b>		
Less than other courses	-	-
About the same	12	26.1
A little more	10	21.7
More	24	52.2
<b>Learning</b>		
Less learned	-	-
Learned about the same	7	15.2
Learned a little more	21	45.7
Learned more	18	39.1

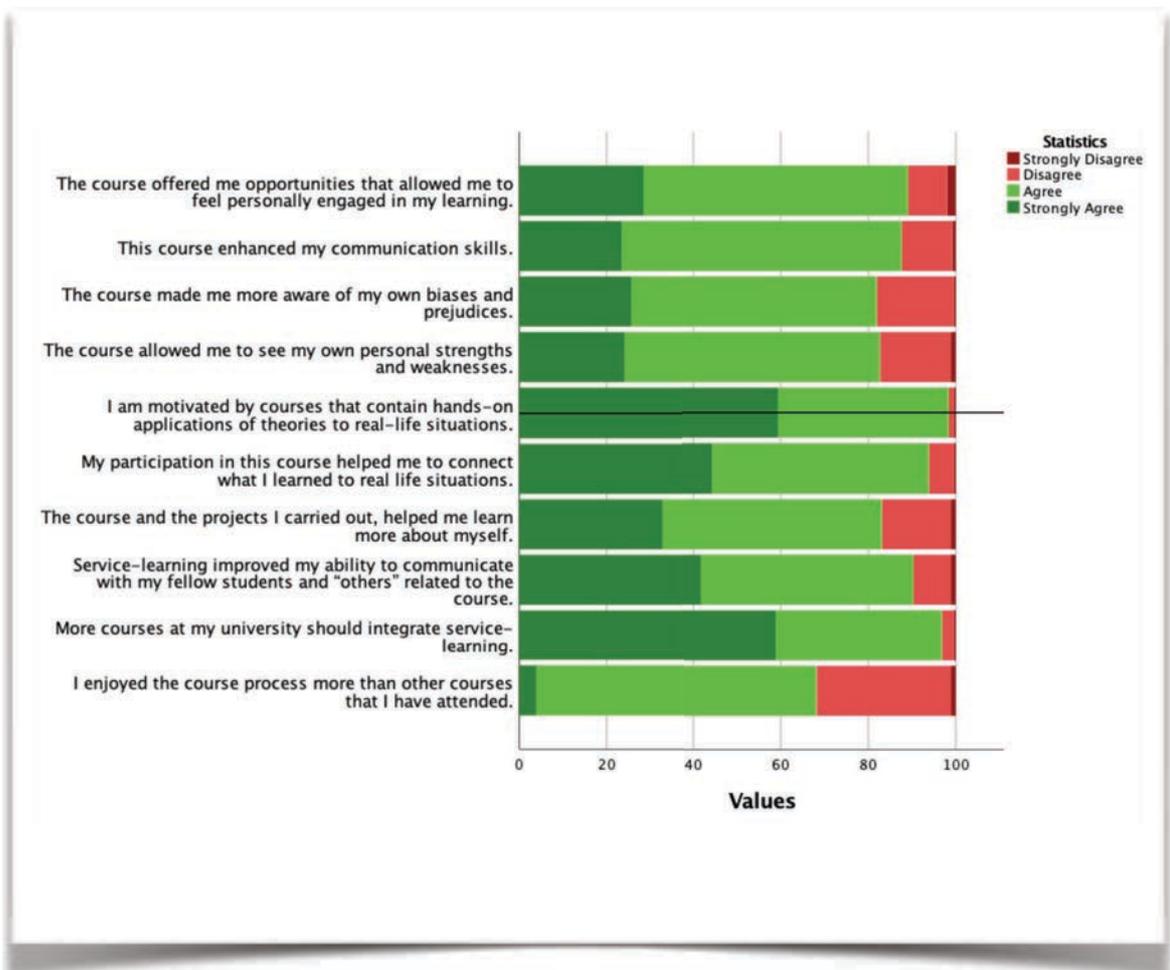
*Table 24. Seminars-related behaviour and opinions*

To conclude, the overall similarity of responses about interest, participation, and learning outcome cannot be denied. It seems that students in general (in both course and seminars) were highly interested in service-learning. Also, it seems that such a course/seminar encouraged their participation so that they eventually reported learning more than on other courses.

**ICT in ESD (2013 & 2014)**

After examining both course and seminar-related behaviours, the synthetic variable “Satisfaction” was explored in a more detailed manner. The exploration was done on the data collected during ICT in ESD (2013 and 2014)

To obtain a more comprehensive insight into students’ satisfaction with the course, the components of the “Satisfaction” synthetic variable are presented in Figure 13. As can be seen from Figure 11, the majority of items had an agreement rate of above 80%. In general, it seems that the students were very satisfied with the course, with 96.9% of students reporting that more courses at their university should integrate service-learning. Participation in this course has helped students to connect their knowledge to real life situations, improve their communication skills, as well as to become aware of their own personal strengths and weaknesses.



**Figure 13. Satisfaction**

Finally, a great number of students (68.2%) reported that they enjoyed the course process more than other courses they have attended. Somewhat lower percentage of agreement on this item possibly implies that there are more courses at the University of Crete, which are equally impressive, an encouraging fact by itself. Many students, during the focus group discussion, at the end of the courses, referred to the actions taken as a “life-changing experience”, as mentioned by students:

*“Recycling has become a way of life for me now.”*

*“We want to take further action on the issue, for us the course is not over yet...”*

### **Satisfaction with the instructor: The association with service-learning**

#### **ICT in ESD (2013 & 2014)**

The satisfaction with the instructor was measured via 8 questions. Thus, the participants’ scores ranged from 0 to 8. The questions were related to the instructor’s interest in the course, feedbacks, assessment criteria etc. The average score was 5.05 (SD = 2.17), indicating the overall satisfaction with the instructor.

	Service-learning	
	r	p
Satisfaction with the instructor	.171	.006

*Table 25. Satisfaction with the instructor (course)*

In order to examine whether there was a relationship between service-learning and satisfaction with the instructor, Pearson’s correlation coefficient was calculated. Results have shown that the correlation was significant ( $r = .171$ ,  $p < .01$ ). However, satisfaction with the instructor explains only 2.9% of the variance in service-learning, which means that the effect size of satisfaction with the instructor is rather small.

#### **Seminars 06 and 07 - academic semester 2013-14**

The scores for satisfaction with the instructor ranged from 0 to 8, with the average score being 4.87 (SD = 2.28), which is only a bit less than in ICT in ESD, but still higher than the average.

As in the case of ICT in ESD, we calculated Pearson’s correlation coefficient to examine the relationship between satisfaction with the instructor and service-learning. The results have shown

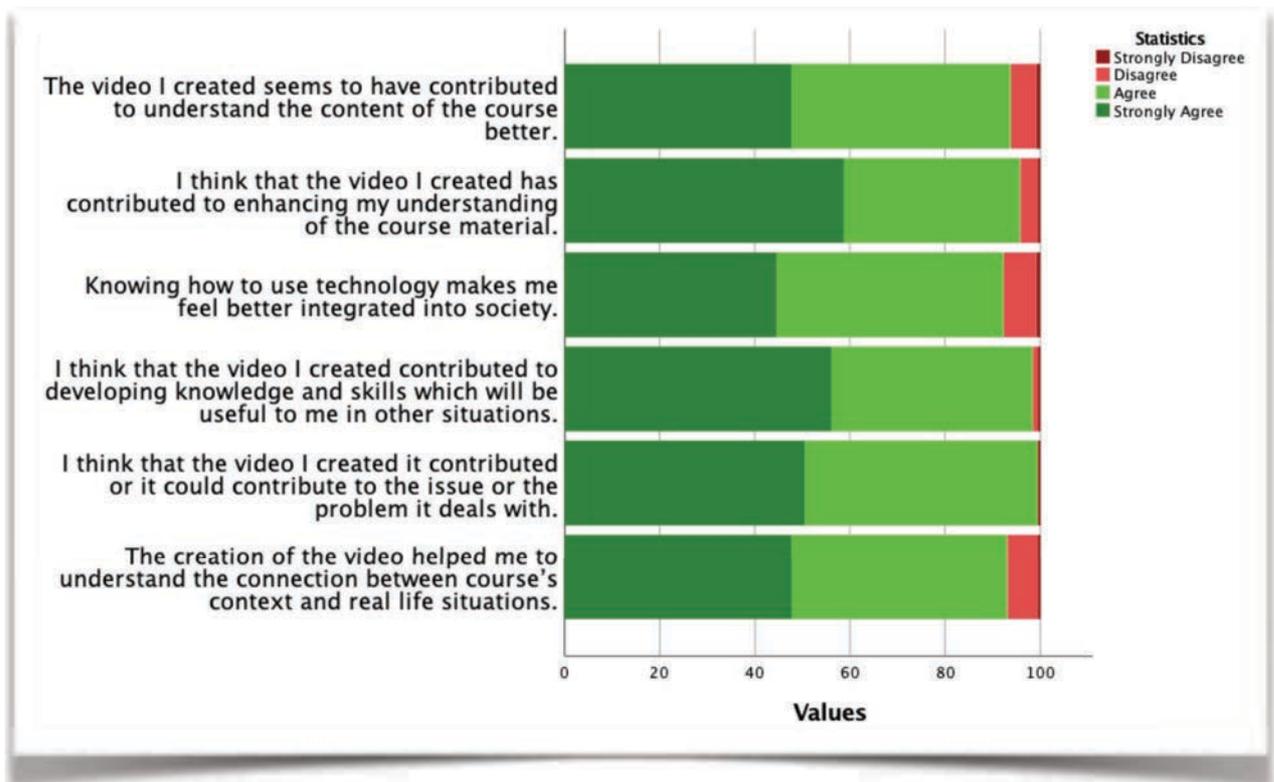
that there was no significant correlation between the examined variables ( $p > .05$ ), which indicates that satisfaction with the instructor did not play a significant role in service-learning. The difference in results obtained in ICT in ESD and Seminars can possibly be attributed to different sample sizes. In particular, the greater the sample size the greater the possibility of detecting a significant relationship. The sample of ICT in ESD was large, compared to the sample of seminars, and even with large sample the effect was rather small. With smaller sample, the effect failed to be detected.

	Service-learning	
	r	p
Satisfaction with the instructor	-.151	.334

*Table 26. Satisfaction with the instructor (seminars)*

### 5.3 The contribution of the ICT

One of the questions we aimed to examine in this study is **“What is the contribution of the ICT to the development of students’ skills and the facilitation of learning”**. Therefore, participants were asked to rate certain statements related to the use of ITC. For all the statements related to the use of ICT, the agreement rates exceeded 90% (Figure 14).



*Figure 14. Use of ICTs*

As can be seen from Figure 14, the highest-ranked item (agreement of 99.6%) is the one reflecting participants' opinion that the video they created contributed or could contribute to the issue or the problem it deals with. In other words, it seems that students consider ICT to be useful for the society. In the case of students' skills, 98.5% of students reported that ICT (in particular, creating the video) contributed to developing knowledge and skills which will be useful for them in the future. When it comes to the **facilitation of learning**, the majority of students believe that the use of ICT contributed to understanding the course material/content better. Moreover, it helped them to understand the connection between the course's context and real life situations (93.1%). Finally, the majority of students reported that knowing how to use technology made them feel better integrated into society (95.8%).

Moreover, we wanted to check our fourth hypothesis: **“The use of ICTs will have a significant impact on students' attitudes towards change, satisfaction and self-confidence for the course.”** In order to statistically compare attitude towards change, satisfaction and self-confidence between the groups with regard to their ICT scores, an inferential analysis has been carried out. Specifically, an ANOVA test has been carried out with a subsequent Scheffe Post-Hoc test to verify whether the scores were statistically higher in some groups compared to others.

Three separate ANOVA tests were applied, one per each dependant variable (attitude towards change, satisfaction and self-confidence). As ICT was initially a continuous variable (an average of all ICT-related items), a transformation was required in order to include ICT as independent variable in ANOVA. Thus, continuous ICT was recoded and three categories were made (1.those who scored less than 3; 2.those who scored between 3.01 and 3.50; 3.those who scored between 3.51 and 4)

	Levene Statistic	df1	df2	Sig.
Attitude towards change	9.594	2	252	.000
Self-confidence	3.382	2	254	.036
Satisfaction	2.477	2	248	.086

*Table 27. Test of homogeneity of variances*

Prior to conducting ANOVAs, homogeneity of variances was examined via Levene's test. Results have shown that the variance was homogenous in the case of satisfaction, and not homogenous in the case of attitude towards change and self-confidence (Table 27). Therefore, regular One-Way

ANOVA was used for satisfaction, whereas Welch ANOVA was used for attitude towards change and self-confidence.

Results have shown that there were significant differences between the three ICT groups in terms of satisfaction (Table 28), as well as in terms of attitude towards change and self-confidence (Table 29).

	Sum of Squares	df	Mean Square	F	Sig.	
Satisfaction	Between Groups	14.616	2	7.308	72.725	.000
	Within Groups	24.920	248	.100		
	Total	39.536	250			

**Table 28. ANOVA: Differences in satisfaction between ICT groups**

	df1	df2	F	p
Attitude towards change	2	114.19	25.48	.000
Self-confidence	2	120.52	20.53	.000

**Table 29. Welch ANOVA: Differences in attitude towards change and self-confidence between ICT groups**

To examine between which groups these significant differences appear, post hoc tests were applied. In particular, Scheffe post-hoc test was applied for satisfaction, while Games-Howell was applied for attitude towards change and self-confidence.

Results have shown that all three groups significantly differed from each other in terms of satisfaction and attitude towards change. In the case of self-confidence, there was a significant difference between the first and the third group, as well as between the second and third. The difference between the first and the second group was not significant (Table 30). The group scores on all three dependent variables are presented in Table 30.

The **Use of ICTs** variable measures the relevance of new technologies with the facilitation of learning, developing skills and contributing to society. The group with the higher ICT had higher attitude towards change, higher self-confidence and higher satisfaction.

Dependent Variable	I (ICT)	J (ICT)	Mean Difference (I – J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Attitude towards change (Games-Howell)	1	2	-.157	.059	.027	-.298	-.015
		3	-.342	.056	.000	-.476	-.209
	2	1	.157	.059	.027	.015	.298
		3	-.186	.037	.000	-.273	-.098
	3	1	.342	.056	.000	.209	.476
		2	.186	.037	.000	.098	.273
Self-confidence (Games-Howell)	1	2	-.156	.075	.103	-.336	.024
		3	-.401	.072	.000	-.574	-.229
	2	1	.156	.075	.103	-.024	.336
		3	-.245	.052	.000	-.368	-.123
	3	1	.401	.072	.000	.229	.574
		2	.245	.052	.000	.123	.368
Satisfaction (Scheffe)	1	2	-.326	.056	.000	-.465	-.187
		3	-.636	.054	.000	-.769	-.502
	2	1	.326	.056	.000	.187	.465
		3	-.310	.045	.000	-.420	-.199
	3	1	.636	.054	.000	.502	.769
		2	.310	.045	.000	.199	.420

**Table 30. Post Hoc tests - attitude towards change, satisfaction, self confidence across ICT groups**

With the results specified in this section, the fourth hypothesis can be accepted (Attitude towards change, Self-confidence and Satisfaction are different depending on the ICT group). This hypothesis is accepted since the groups with the highest ICT are the ones with highest scores on the three variables of interest.

	Group	N	M	SD	Min	Max
Attitude towards change	1	49	3.20	.359	2.00	3.71
	2	93	3.36	.288	2.71	4.00
	3	113	3.54	.23	2.71	3.86
Self-confidence	1	49	2.76	.45	1.83	3.50
	2	93	2.92	.38	1.83	4.00
	3	115	3.17	.36	2.17	4.00
Satisfaction	1	49	2.76	.38	1.36	3.36
	2	89	3.09	.29	2.09	3.82
	3	113	3.40	.30	2.64	4.00

*Table 31. Descriptive statistics - attitude towards change, satisfaction, self confidence across ICT groups*

#### 5.4 Relationships between synthetic variables

The previous section explored each synthetic variable separately, by interpreting the content (components) of each variable. However, we also wanted to examine how the five synthetic variables are related to each-other. In particular, we were most interested in seeing how service-learning is related to other four variables. Our hypothesis was: **“Students’ attitudes towards change, self-confidence and satisfaction will significantly predict service-learning for both the course and the seminar.”**

In order to examine whether service-learning is related to students’ satisfaction, self-confidence, and attitude towards change, correlation analysis was used. As in the previous sections, the results are reported separately for ICT in ESD (2013 and 2014) and Seminar (06 and 07).

##### **ICT in ESD - Academic semesters 2013-14 & 2014-15**

Participants’ answers ranged from strongly disagree (1) to strongly agree (4). In order to make the scores on all five variables comparable, average scores are calculated instead of summation scores. Descriptive statistics for all five synthetic variables (attitude towards change, satisfaction, self confidence, service-learning and ICT) are presented in Table 32.

	N	M	SD	Min	Max
Attitude towards change	256	3.41	.31	2.00	4.00
Satisfaction	252	3.16	.40	1.36	4.00
Self confidence	259	3.00	.42	1.70	4.00
Service-learning	255	3.28	.33	1.70	4.00
ICT	259	3.46	.40	1.00	4.00

**Table 32. Descriptive statistics: synthetic variables**

Results of the correlation analysis (Pearson correlation coefficients) have shown that the inter-correlations between five synthetic variables were all significant (Table 32). Service-learning correlated positively with the other four variables, meaning that the higher the attitude towards change, satisfaction, self-confidence, and ICT, the higher the service-learning can be (active citizenship).

	Attitude towards change	Satisfaction	Self confidence	Service-learning	ICT
Attitude towards change	1	.517**	.376**	.539**	.414**
Satisfaction		1	.372**	.575**	.707**
Self confidence			1	.515**	.412**
Service-learning				1	.526**
ICT					1

\*\* . Correlation is significant at the 0.01 level

**Table 33. Inter-correlations between five synthetic variables (course)**

### **Service-learning: the role of personal characteristics**

In order to provide a better understanding of service-learning, we examined its relationship with the following personal characteristics - attitude towards change, self-confidence, and satisfaction.

	B	SE	$\beta$	p	R	R <sup>2</sup>	F	p
Attitude towards change	.291	.061	.268	.000	.689	.475	72.012	.000
Satisfaction	.283	.048	.333	.000				
Self-confidence	.219	.042	.273	.000				

**Table 34. Predicting service-learning from attitude towards change, self-confidence, and satisfaction (course)**

Multiple regression was conducted, with predictor variables being: attitude towards change, self-confidence and satisfaction. The dependent variable was service-learning. Results have shown that the overall model was significant and that the three predictors explained 47.5% of the variance ( $R^2 = .475$ ,  $F(3,239) = 72.012$ ,  $p < .01$ ). All predictors included in the model, made a significant contribution explaining service-learning. In particular, the three personal characteristics significantly predicted service-learning, with the effect being highest for satisfaction ( $\beta = .333$ ,  $p < .01$ ). The effects of self-confidence ( $\beta = .273$ ,  $p < .01$ ) and attitude towards change ( $\beta = .268$ ,  $p < .01$ ) were roughly equal. The first part of our hypothesis: **“Students’ attitudes towards change, self-confidence and satisfaction will significantly predict service-learning for the course.”** is confirmed. In other words, satisfaction, self-confidence and attitude towards change increase students’ engagement in service-learning. Below we are exploring the same hypothesis for the seminars.

#### **Seminar 06 & 07 - Academic semester 2013-14 - Correlations between synthetic variables**

Although there is a difference in the ICT in ESD sample size and seminar sample size, we wanted to examine whether the pattern of relationships between the synthetic variables would be similar. The correlations were calculated using the data collected after, and not before the seminar, so the results could be comparable to those from the first phase (participants completed the questionnaire after the ICT in ESD course). Results have shown that service-learning significantly correlated with self-confidence, attitude towards change and satisfaction (Table 35). Moreover, attitude towards change significantly correlated with satisfaction and self-confidence, and satisfaction and self-confidence were also correlated. The second part of our hypothesis is also confirmed: **“Students’**

**attitudes towards change, self-confidence and satisfaction will significantly predict service-learning for the seminar.”**

	Attitude towards change	Satisfaction	Self-confidence	Service-learning	This course has changed me
Attitude towards change	1	.749**	.562**	.542**	.504**
Satisfaction		1	.542**	.503**	.565**
Self-confidence			1	.558**	.435**
Service-learning				1	.250
This course has changed me					1

\*\* . Correlation is significant at the 0.01 level.

*Table 35. Inter-correlations between five synthetic variables (seminars)*

When multiple regression was conducted (with predictor variables being attitude towards change, self-confidence, and satisfaction), the overall model was significant and was explaining 39.2% of the variance ( $R^2 = .392$ ,  $F(3, 39) = 8.385$ ,  $p < .01$ ). Nonetheless, out of the three predictors, only self-confidence was shown to be significant ( $\beta = .347$ ,  $p < .05$ ).

	B	SE	$\beta$	$p$	R	$R^2$	F	$p$
Attitude towards change	.458	.346	.259	.194	.626	.392	8.385	.000
Satisfaction	.172	.291	.115	.557				
Self-confidence	.365	.164	.347	.032				

**Table 36. Predicting service-learning from attitude towards change, self-confidence, and satisfaction (seminars)**

## 5.5 Analyzing the digital storytellings

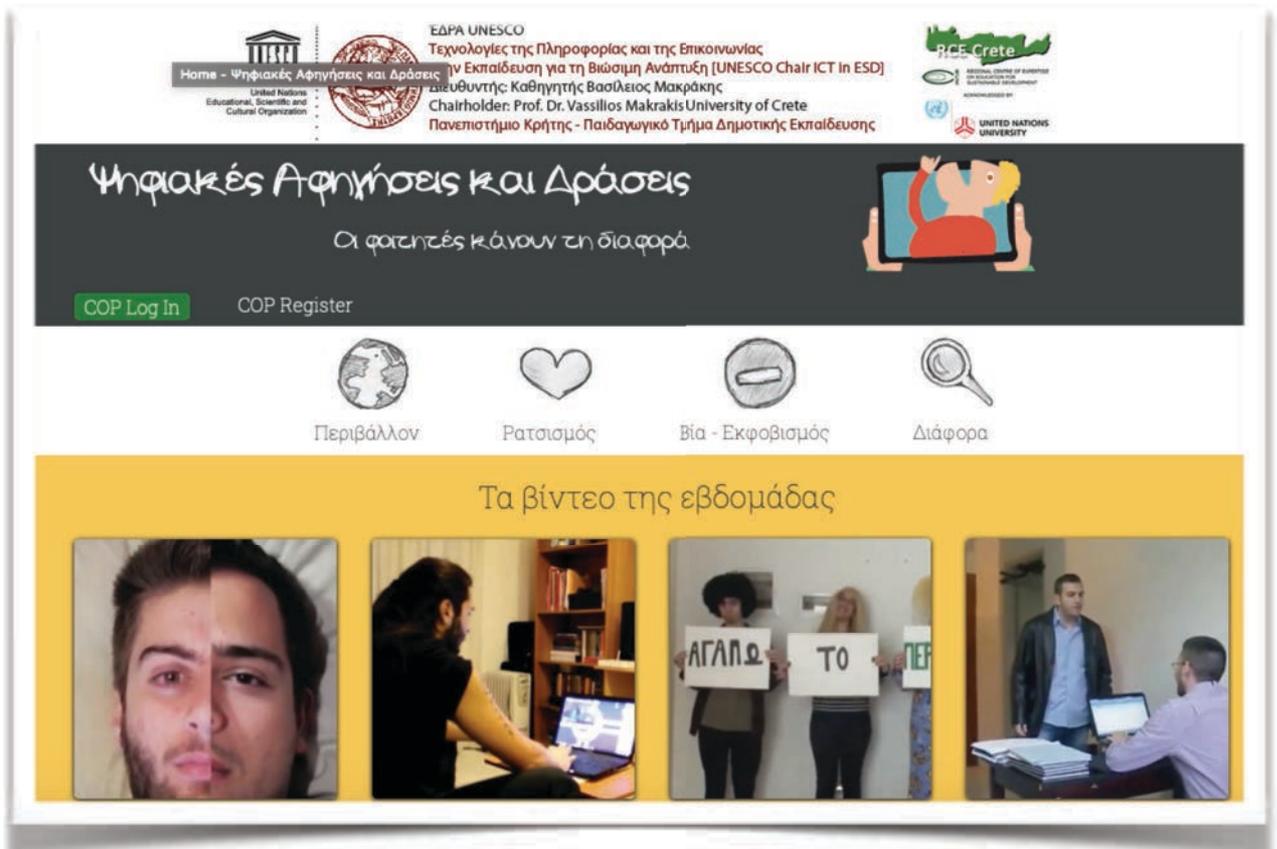
### 5.5.1 Overview

For the "ICT in ESD" course and the seminars, students had to create and present a storytelling video as part of their evaluation. They formed teams up to five persons, and in each video, they had to address a social issue in their local community, according to their view.

According to the course outline (Appendix A), the students examined the relationship of curriculum with theme based learning focussing on sustainability issues. The students were guided to select five themes dealing with sustainability. Then they had to consider whether those themes were important for their communities. At the end, they had to choose one and reflect on it. Is it a useful theme? Does it fit in their communities needs? Does it fit into their personal interest? A research had followed to find sample thematic units and to explore lesson plans related to the chosen themes. The students had to describe the unit plan in a paper comprised of five interlinked sections:

- Activation
- Teaching/Learning tasks
- Learning processes
- Reflective feedback
- Cross curriculum extensions

Next step for the students was to explore the potentialities of hypermedia technology. The main aim was to create a digital participatory video to advocate, empower and build capacity (indirect service-learning). Some students chose to take action on their selected topic, so their service-learning was direct. The students had to conceptualise a participatory video project idea, to develop a participatory video project proposal, to do research on it and to write/evaluate the script and the storyboard. A rubrick was provided to the students in order to assess their storyboard and the script of their participatory video. Last modules were dedicated to video clip production and post-production of the video clips. At the end, the students had to integrate the video-clip they produced into the curriculum.



**Figure 15.** Website with the participatory videos created (PVs) and the community of practice (COP)

During the academic year 2013-14, 132 students created 62 videos. In the following academic year, 163 students produced 55 videos. In total, 117 storytelling videos were created by 295 students during these two academic years.

The digital storytellings were uploaded in the channel of “RCE Crete” on YouTube, and a webpage was created to display those videos (see Appendix F or visit <http://www.aesop.edc.uoc.gr>) and host a community of practice. In an attempt to categorise students’ videos, the following four categories occurred: environment, racism, violence and various. In particular, 32% of the videos are related to racism, 27% to the environment, 18% to bullying - violence and the rest 23% address to miscellaneous issues (child labour, road safety, HIV, drug use, fanaticism and many more).

Students produced high-quality videos. Digital storytellings included original scenarios spotlessly directed, recorded testimonies, real stories, interviews on local channels, actions in and out of the university campus, statistical data, specially created graphics and many more inspiring ideas. Students used an enormous amount of energy, imagination and creativity to produce each digital storytelling. Many of them involved their friends, family or even the local community in the production procedure.

The digital storytellings that students created were presented at the end of each semester at the University of Crete. The first meeting took place on the 2nd of April 2014 and the second on the 27th of May 2015 (Appendix E.). Both sessions gathered the majority of the students who attended the course and had great success. Students who joined the presentation, participated in a group discussion. They shared their enthusiasm from their experience with the course and they enjoyed talking with passion for all the actions they took and their future plans.

The group discussion was recorded. Moreover, six participants were interviewed to enhance our understanding of the course impact. The overall impression from the focus group discussion and the interviews was immense enthusiasm and passion. The need to change our mentality and the value of volunteering was highly mentioned by the students. It rather impressed us that many teams had already thought to take further action on their study issue. All of the students expressed their excitement about the procedure. The fact that theory was connected to praxis was highlighted. Students mentioned that they enjoyed the connection. Before the project, a few students doubted whether they could make an impact on their community. In the end, they all confirmed that during the project, they all felt that their actions were definitely making an impact.

A remarkable fact is that students compared their experiences with their future lives. They mentioned that having had this experience will make them want to participate and resolve future local and global issues. Besides, they acknowledged that the first step to change a situation is to believe in change.

Most teams mentioned that their experiences were life-changing. For example, there was a team who chose the issue of road safety. The members of this team had the chance to use an accident simulator. To raise awareness on their topic, they created a video with original content and presented it to candidate drivers. Their idea was simple but effective. The video was well made and to the point. The teachers of the driving school embraced their idea and asked them their permission to use their footage for all their future candidate drivers.

### **5.5.2 Participatory videos methodology**

The participatory videos methodology included three main phases, as presented in the course outline (Appendix A). The first phase focused on providing pre-service teachers with the knowledge and skills to use participatory video as empowerment and transformative tools. At this point, the course presented case studies, particularly related to local, sustainability issues. The aim

is to illustrate how community members can be “empowered” to make their voices heard in the process of building a sustainable society.

The second phase focused on developing participatory video-clips based on community sustainability projects. Using participatory techniques, such as focus group discussions, individual interviews and writing scenarios students were involved in gathering testimony from the youths and other community members involved in producing the participatory videos.

The third phase included: (1) the uploading of the participatory video clips produced into social networking media and (2) the integration of the participatory video-clips into lesson planning. Finally, the last phase involved participants in a self-reflective and reflexive process, evaluating the strengths and weaknesses of participatory video. (Makrakis, 2014b)

Through this course, pre-service teachers and community members produced video projects that can be categorized as "authentic" learning activities because they take place in the "real world". Themes integrated into the video-clips incorporated environmental, social and economic aspects of education for sustainability. Projects developed by students in cooperation with community members, for example, the issue of road safety through the eyes of an accident victim, saving energy through students' eyes, children's violence and abuse, sustainable fishing, religious racism and many more. Through these participatory videos, service-learning applied for awareness-raising, advocacy and empowerment of those affected but students also developed competencies on ICT skills. Moreover, on the one hand, the methods selected and implemented were driven by critical reflection that helped participants to deconstruct their prior theories such as beliefs and perceptions on the issues studied. On the other hand, it helped them to reconstruct their theories through meaning-making (Makrakis, 2012b).

### **5.5.3 Participatory videos directly connected to service-learning**

#### **Car accidents (Road safety)**

The purpose of this participatory video is to raise awareness about car accidents. Students have done a research about car accidents, and they presented us with some striking statistics. Besides, they have interviewed and recorded a man who was involved in a car accident. The participatory video was produced by the academic year 2013-14 and it is uploaded on the youtube channel of RCE Crete (<https://youtu.be/ags7p2ETk6Q>).



*Figure 16. Students are using the PV produced to educate future drivers*

The storytelling begins with two advertisements for car accidents which shock you. The selection of the spots is not random, as the students want to raise awareness and focus on the fact that simple things could save lives. Even 10km less, a seatbelt, a helmet could be decisive for your life.

An interview with a person who was involved in a deadly car accident follows. The driver who was involved in the car accident mentions that he was shocked while reading the forensic examination. The motorcyclist was killed by the only injury he had on his head. If only he were wearing a helmet, he would have been alive. What he also emphasises during the interview is how difficult his life was after the car accident. He had to take part in many trials, and that was tough. As he describes in his interview, he had to relive the terrible car accident every single time.

The students launched a campaign for their city's drivers. They distribute leaflets to drivers to raise awareness on the simple things which could save lives. In cooperation with a driving school, they presented videos to inform future drivers and raise awareness about responsible driving. The action had a significant impact, and the driving school asked permission to use the videos for all their future drivers.

This team focused on a severe problem of their local community. In the island of Creta, it is common to drink and drive or to drive without a helmet or your seatbelt. They did research, and they contacted people who had been involved in accidents. They decided to take action, and they inspired the driving school to adopt their information into their study program. The potential of this action will have a long lasting impact on the local community. Road safety is an issue that could be succeeded by a swift in drivers' mentality. Once they realise how important it is to be responsible while driving their attitude will change.

### **Hope for tomorrow (Recycling)**

The purpose of this participatory video is to promote recycling. Students have interviewed other students, staff and faculty members of their university to gather opinions on the issue. The participatory video was produced by the academic year 2013-14 and it is uploaded on the youtube channel of RCE Crete (<https://youtu.be/clclJj50bdg>).

The storytelling begins presenting interesting facts about recycling in their university. Through the interviews they realised that: bins for recycling are fewer than other bins and the distances to the recycling bins are long. There were even students who were not informed that there are recycling bins in their university. Other students mentioned that they did not know about recycling at all or even worse that they were not interested. Students decided to act and they created bins for paper and plastic which they placed all around their university. They even set a goal to reach 800 kilos of



*Figure 17. Students present their action on a TV channel*

recycling material. They placed the bins all around.

After the impact of their action, a local channel invited the students to present their action to inform more citizens on recycling. The journalists were impressed and asked the students many information about their action, their motivation and what they learnt from the procedure. Students mentioned that they learned many things through this procedure. They mentioned that they learned how to recycle and facts like: small papers cannot be recycled, dirty plastic cannot be recycled etc. “Whatever finishes, can have a new life....” was the message of the students. The journalists highlighted the importance of taking action which has a real impact.

### **Think, before you judge.... (Homophobia)**

The purpose of this participatory video is to raise awareness on the issue of homophobia. Students have interviewed a family with two mums. The students deal with a hot issue of the greek society since they present opinions of young people who seem to be afraid of the LGBTQi community. In this field information and presentation of role models is rare in Greece, so the video produce is of great value. The participatory video was produced by the academic year 2014-15 and it is uploaded on the youtube channel of RCE Crete (<https://youtu.be/UVTjg7ITklw>).

The participatory video begins with two women who are interviewed. Afterwards, a montage of interviews is presented. Interviews include young people’s opinion on the issue. Some of them mention that they want to be violent toward homosexual persons, others that they do not like those



*Figure 18. Interview on the topic*

people and some mention that homosexuality is an abnormality. Even people who are informed and support the homosexual families admit that it is still a taboo for the greek society.

The students present a few slogans against racism and homophobia. The interview goes on and the parents talk about the issue of visibility. They mention that nowadays you can live peacefully with your homosexual family in case you will choose to hide. They wonder if a hidden life can be a happy life. The fact that one family of their community was interviewed by a famous greek newspaper was shocking enough and the reactions this interview raised were unbelievable. After that event, they doubted the concept of visibility and they highlighted the importance of a legal framework. Otherwise, visibility could be dangerous for them.

The students invite us to walk in their shoes and think before we judge them. The original material the students produced, threw some light on the issue.

#### **5.5.4 Participatory videos indirectly connected to service-learning**

##### **Students full of energy (Energy consumption)**



*Figure 19. Message from the students*

The purpose of this participatory video is to raise awareness of the energy issue. Students present the issue of energy waste. In particular, they present short video-clips where students are overusing electricity, water and heating in their students' residence of the University of Crete. The participatory video was produced by the academic year 2013-14, and it is uploaded on the youtube channel of RCE Crete ([https://youtu.be/Q\\_k1Zjvshmk](https://youtu.be/Q_k1Zjvshmk)).

The students deal with the issue presenting the students-heroes of the clips absurdly consuming energy. Afterwards, they present information and data on the adverse side effects the waste of energy cause. The digital storytelling proceeds, presenting the same students-heroes who were wasting energy to invent ways of saving energy, being thoughtful and respectful towards the environment.

Students visualise smart and yet easy ideas to save energy such as wearing a light jacket instead of turning the heating on, adjust the air condition at a reasonable temperature, reduce the shower time to save water and energy and many more.

At the end of the digital storytelling, students display their motto: "I care, I respect, I change - I love environment", and they present some compelling and persuasive statistics about users' behaviour. We can reach a 10% reduction in energy consumption only by changing our habits which is translated to 13400kwh or 11400 kg of CO<sub>2</sub>. Exciting and impressive statistics which makes the viewer believe he/she can make a difference. Last but not least, the video concludes with a greek poem from Kazantzakis: " Love responsibility. Say: It is my duty, and mine alone, to save the earth. If it is not saved, then I alone am to blame" Simple, funny and yet such inspiring digital storytelling.

### **Where were you? (Participation is students' unions)**

The purpose of this participatory video is to highlight the importance of students' participation in the students' unions. Students present the issue of students' absence during their department's general assemblies. The participatory video was produced by the academic year 2013-14, and it is uploaded on the youtube channel of RCE Crete ([https://youtu.be/WCl0P7\\_FtkU](https://youtu.be/WCl0P7_FtkU)).

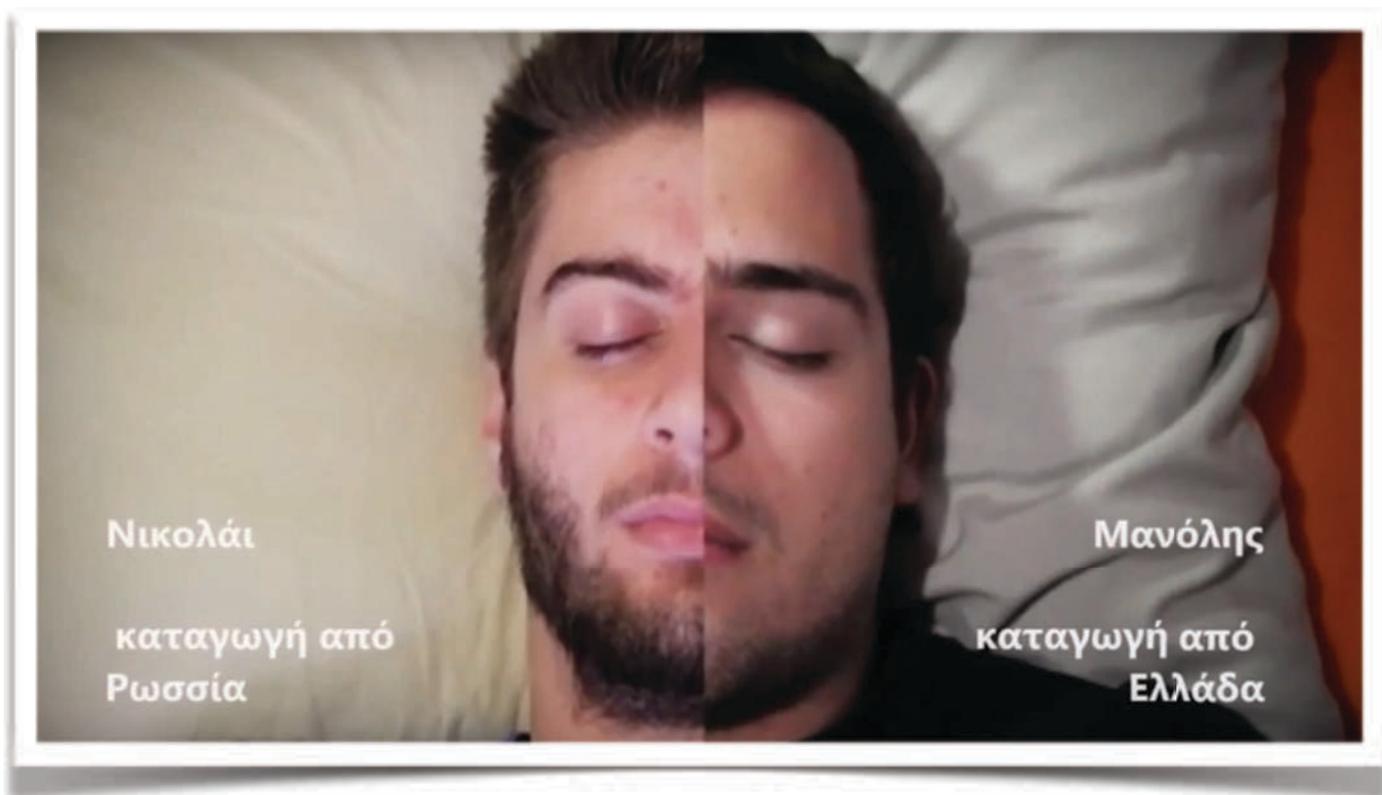
Students have recorded an announcement with the worst-case scenario for their university: "The government have decided to shut down their department". So the students' union calls all university students to participate in an extraordinary assembly upon the upcoming issue.

Digital storytelling is skilfully directed. During the detailed announcement of the issue, there is a switching between black screens and photos which present various issues of students' unions. Issues presenting the indifference of the students and the aggressiveness during the assemblies. Another issue presented is the disrespect of students' unions for the environment, like pollution, with the production and distribution of leaflets.

At the end of the storytelling, students present the assembly room to be empty and imply that the non-participation of the students will lead them to the destruction of their university. If they do not claim their rights, then who will? The question posed at the end is the title of the current digital storytelling: "Where were you?"

### **Under the same moon (Diversity - immigrants)**

The purpose of this participatory video is to unfold a situation from a different point of view. The participatory video was produced by the academic year 2014-15, and it is uploaded on the youtube channel of RCE Crete (<https://youtu.be/40kTqV1uULE>).



*Figure 20. Following two different lives in the same city*

The digital storytelling begins with the words of William Sloane Coffin: "Diversity may be the hardest thing for a society to live with, and perhaps the most dangerous thing for a society to be

without". Afterwards, a brief history of the city of Chania is presented. The fact that Chania has been a multicultural city throughout the centuries is highlighted. Nowadays, the city has a significant number of foreigners who have not met the ideal circumstances. They have to cope with racism, fear and prejudice. The narrator asks: "Why do we treat them like that? In the end, are we so different?"

Students have produced their short film with two heroes - Nikolai from Russia and Manolis from Greece. We have the chance to watch their daily habits in comparison. Digital storytelling's direction has thoughtful touches and puts the viewer in the right spirit. The video clip is fascinating to watch and makes the viewer think of the simple fact: "We are all humans". The effort is touching and impressive. The video clip ends with a night scene in front of the sea, under a full moon. Students are looking at the moon and send us their powerful message: "Look over there! We ALL see the same moon!"

## 5.6 Chapter Summary

The goals of this study were to integrate service-learning, raise awareness on volunteerism, develop actions enabled by ICTs and evaluate the whole process. Assessment criteria are the connection of university with the local community, the social contribution and the development of active citizens. The goals have been met. Service-learning was integrated successfully, students' awareness on volunteerism was activated, and actions developed and presented through digital storytellings. The comparisons of scores (before and after the seminars) have shown a significant increase in service-learning. The integration of service-learning increased students' awareness for social issues, their willingness to volunteer and the development of personal skills (active citizens).

Examination of the relationship between the components of service-learning identified that all variables are consistently associated with the attainment of service-learning.

The data underscored the importance of a shift towards experiential education strategies, such as service-learning enabled by ICTs. Higher education should integrate more courses which connect course content to volunteerism for the local community. Education for sustainable development demands new ways of teaching and learning.

## CHAPTER 6: DISCUSSION AND CONCLUSION

This study aimed to explore the integration of service-learning in a course of the Department of Primary School Education of the University of Crete in Greece. The integration of service-learning in this course is intended to serve as an example of how service-learning can be infused across study programs. In order to obtain a comprehensive understanding of service-learning, this study addressed several important questions which will be discussed in this chapter.

In particular, the chapter begins with the discussion of students' preconceptions on service-learning. It continues by exploring students' attitudes towards the principles of service-learning and their satisfaction with the course. In particular, we will answer whether the integration of service-learning raised students' awareness of social issues and volunteering and whether it helped students believe that they can contribute to their communities. Moreover, we will discuss the contribution of ICT to the society, the development of students' skills and the facilitation of learning. The relations between service-learning and satisfaction, self-confidence and attitude towards change will also be discussed. Last but not least, we will discuss the students' outputs, meaning, videos they created at the end of the course.

After discussing each of our research questions separately, a general discussion on service-learning integration in a course of Primary School Education Department will take place. Finally, the strengths and limitations of this study, as well as the recommendations for future research, will be discussed.

In terms of preconceptions about service learning, students covered all expected outcomes of service-learning. In particular, they highlighted the notions of cooperation, volunteerism and active citizenship as the main components of service-learning. Students' preconceptions explain that: "service-learning is a learner-centred teaching approach which requires cooperation, fosters volunteerism and leads to active citizenship." Similar findings can be found in the existing literature (National Service-Learning Clearinghouse, n.d.; Sigmon, 1979; Jacoby, 1996; Stanton et al., 1999).

Students' preconception about service-learning covered the following areas: following outcomes of service-learning: academic learning and educational success, personal development, social and interpersonal development, ethical and moral development, civic capacity and civic responsibility, and career awareness and preparation (Furco et al., 2010). Overall, we can conclude that our first research question has been answered, as we have explored in depth students' preconceptions about service-learning.

Our second research question was related to students' attitudes towards the principles of service-learning after taking the course and the seminars.. Our hypothesis was confirmed: "There was a significant difference between students' service-learning scores before and after the completion of the seminars". Students, as shown from the results, have a positive attitude towards service-learning. In other words, it seems that students believe that getting out of their comfort zone and making an effort to help the community "pays off", as it is valuable both to the community and for students themselves. Awareness of the issues, willingness to volunteer (Warburton & Smith, 2003; Milligan & Fyfe, 2005; Marta et al., 2010), readiness to change (Ross, 2007) and confidence to take action (Kielburger & Kielburger, 2002; Cruz et al., 2019) are all elements of active citizenship. As the projects students chose to work on were mostly related to advocating particular issues and/or raising others' awareness of particular issues (e.g., awareness of racism, energy waste, recycling, protection of public spaces), we expected that students' awareness would increase after this course. The reflection is the notion that differentiates service-learning from volunteerism (Boud et al., 1985). Thus, the key point here is that we did not only give our students the chance to experience service-learning but also the chance to reflect on their experience throughout focus groups and course discussions. The study demonstrates a correlation between active citizenship and service-learning when reflection on the experience happens.

Moreover, descriptive statistics has shown that students' awareness of social issues was quite satisfying at the end of the course. Also, the inferential statistics has confirmed that awareness of social issues was significantly higher at the end of the course, compared to the beginning (Eyler, 2002; Furco & Billig, 2002).

An unexpected result which has to be mentioned was that students seem not to believe that community service and voluntary work will help them develop leadership skills (Des Marais & Farzanehkia, 2000; Colby et al., 2009; Celio et al. 2011; Foli et al., 2014). The qualitative data extracted were used to clarify that aspect. The students' words revealed that leadership was probably confused with the notions of "authority" and "imperiousness". In other words, it seems that the high percentage who disagrees that service and voluntary work will help them develop leadership skills, thinks of leadership skills in a negative way (e.g., as of a title or position somebody is given - being a leader means being a boss). All team members required leadership skills to design and implement their action and all teams succeeded. Thus, the analysis confirms that students did develop leadership skills during this course, but did not recognize such skills as those of a "leader".

Education must change in order to meet the demands of an ever-evolving society, and the most effective way of changing education is through teachers. Nevertheless, to be able to change education, teachers have to be open towards changes in the first place. As students of the Primary Education Department are the future teachers in our school classrooms, we were interested in examining their attitude towards changes. Our hypothesis was: **“There will be a significant difference between students’ attitude towards change scores before and after the completion of the seminars.”** In other words, we wanted to see whether our students are willing to challenge their ideas, values and beliefs, as it is a prerequisite towards making some changes and progress within the field of education. Moreover, we wanted to examine whether the service-learning course has affected students’ attitudes towards change in a positive manner. The same way that service-learning serves as the context for experiencing, constructing and transforming knowledge with action for change (Felten & Clayton, 2011).

Our results have shown that, after completion of the course, our students were eager to engage in discussions with people of different ideas and values, challenge their beliefs and consider taking various perspectives into account. Finally, our students reported that developing a philosophy of life which promotes personal and social changes is of great significance to them. In other words, results have shown that our students do have positive attitudes towards changes (Celio et. al., 2011). With a positive attitude, they can participate in changing the education system. Yet, more important might be their role as pillars of change (Anderson, 1998). In other words, I believe that teachers with positive attitude can use their continual contact with youth and further inspire their students towards making progress and social changes.

Speaking about the influence of service-learning course on attitude, I have to note that our students expressed interest in rethinking their actions and finding new ways of understanding them. They expressed enjoyment questioning the way things are done. They reflected on their actions and seek for improvements. Reflection is the essential characteristic of service-learning (Cress et al., 2005; Weigert, 1998). Without reflection, we possibly would not have the change in attitudes. As our course included both experiences and reflection, we expected that it will increase the positive attitudes towards changes (Gaines-Hanks & Grayman, 2009; Deeley, 2010; Cipolle, 2010; Bartleet et al., 2019).

However, our results from the seminar did not show that service-learning increased positively attitudes towards changes. Attitude scores did not significantly change from before the seminars were taken to after they were completed. On the other hand, descriptive statistics and qualitative

data from the course and the seminar reveal that service-learning had an effect on attitude towards change. After the completion of the course, students' statements were in line with our hypothesis. Students declare that over the next six months they want to take action. This is an encouraging fact that reveals their need to participate and to change. The fact that we didn't get the expected results from the test will not be ignored but there are several reasons that it cannot stand by itself (without the support of the rest of the data). The sample of the students who took part in the seminars is relatively small (N=46) so we couldn't conclude that service-learning seminars did not have an effect on attitude towards change, just by this analysis. In addition, one more thing has to be emphasised. In particular, these seminars were not mandatory but elective. Therefore, it is possible that students who attended these seminars already had an overall positive attitude towards changes, and thus, opted to attend a seminar that is in line with their attitude. In other words, it is possible that the seminar did not "promote" positive attitude in students, as their attitudes were already positive. However, it is recommended for the future research to try replicating these findings using data from both mandatory and elective courses that are infused with service-learning concepts and principles. Ideally, future studies should also use a larger sample size. Finally, this study did not use identical questionnaires to examine attitude towards change before and after the seminar. Maybe the future studies should try using the same questionnaire, to control for the differences in items.

Finally, we can conclude that our students generally have a positive attitude towards changes, which is very encouraging, considering their future profession. Our hypothesis was confirmed. A positive attitude towards changes can turn future educators to pillars of change due to their contact with youth. The service-learning course was shown to increase the positive attitude. The existence of such a course is of great importance because there are students that already have positive attitudes, and that may find such courses to be the places for expressing those attitudes. In addition, they might find such courses to be the places for exchanging ideas, values, beliefs with other people similar to them.

We examined if the students have a positive attitude towards changes. Yet, one can have a positive attitude towards changes, but still, be insecure about one's ability to make actual changes. Therefore, besides attitude, we also examined students' self-confidence. Self-confidence was defined as students' perceptions of whether they can have a positive impact and action at the local and/or global level (Vigkou & Makrakis, 2014). In other words, we examined whether our students believe in their ability to make changes.

The results have shown that students do feel that they can have a positive impact and act in both

the local and global level. Our findings are consistent with Simons & Cleary (2006) research, their students learned about local and national politics, develop an appreciation of diversity and at the same time their confidence to their ability to make a difference was increased. Although some students were a bit hesitant when it comes to believing in the possibility of influencing local or global decisions, the majority of them were quite confident. The lower agreement on these statements might suggest that students do not feel as confident when the emphasis is on the individual (I can make a difference), as they do when the emphasis is on being a part of wider community (I can help (others); I can play an important part). Namely, it seems that some students share the belief that “those in power” and “those who decide” are different from the “average” people. Therefore, they believe that some community decisions or changes in the world can be brought only by the people in power and not “ordinary” people like themselves. Nevertheless, we have to keep in mind that all items tend to have high rates of agreement and there are not many students who feel distant from decision-making, locally or globally. All in all, it seems that after the service-learning experience, students are very confident that they can play a significant part and contribute to making some important changes (Deeley, 2010).

Overall, our students have shown both the positive attitude towards change and a fair boost of self-confidence. A positive attitude and self-confidence are essential elements for taking initiatives and making a difference.

In order to examine the factors that took part in the success of the course, we study the frequency of student attendance and its role. Our hypothesis was confirmed: **“The frequency of student attendance to the course significantly increased students’ service-learning in terms of sensitivity to social issues, intention for social service and development of related personal skills.”** Results have shown that the course was well-attended and that the majority of students found it to be interesting. Maybe that was the reason that the majority of students participated in this particular course more than they participated in other courses. They reported that the course connected theory and practise well, which, among other reasons, might be the reason why students learned a lot from this course. According to Moely & Ilustre (2014) a well-planned course that incorporates course content with service and prepares both the community and the students for the service experience may lead them to greater satisfaction with their university experience. The analysis confirms that students who attended less than 5 lectures had lower sensitivity to social issues, willingness for social service and therefore did not develop as many related personal skills. On the other hand students who fully attended the lectures have benefited from all these service-

learning outcomes. The frequency of student attendance is crucial to take the most of a service-learning course.

Besides attendance, interest, participation, and learning, we asked the students whether the course made them more aware of themselves and whether it helped them develop their skills. As presented in Chapter 5, the course has helped students to get to know themselves better, become aware of their strengths and weaknesses, prejudices and biases. It also helped them acquire new or develop existing skills (Stukas et al., 1999;.Brakke et al., 2020).

We live in the era of technology, and the era of the internet in particular. In an era, where everything happens online, and where the integration of ICTs in education seems to be essential (Makrakis, 2011). Therefore, we wanted to know if the students found new technologies to be relevant for the facilitation of learning and development of skills. Our hypothesis was: **“The use of ICTs will have a significant impact on students’ attitudes towards change, satisfaction and self confidence for the course.”**

Regarding the relationship between ICT and service-learning, the results have shown that it is possible to use ICTs to empower students to act as active citizens and boost their impact (Kumar & Vragov, 2009). In the current study, ICT was used during the course and will also be used to ensure the continuity of the community. Students used ICT to produce their digital storytellings which had an impact on their learning. At the same time, the participatory videos produced during the research, were gathered in a pool of educational material. This pool will be used as the yeast to build the modified community of practice (CoP) and possibly inspire more similar practices in the future.

After the course, students reported that the use of ICTs had helped them understand the content of the course better, as well as understand the connection between the course’s context and real-life issues better. Zaranis & Kalogiannakis (2011) suggest that ICT helped primary school learners to gain better understanding of everyday life problems and become aware of potential issues in their daily practice. In other words, the use of ICTs was indeed seen as beneficial when it comes to developing useful skills and integrating the students into society, which was in line with our hypothesis. According to Anastasiades (2017):

*“ICT contributes to encouraging participatory culture, by creating and sharing content in different social and cultural contexts”.*

Moreover, the results showing that students see ICT as highly important provide support to the idea that the integration of ICT in education indeed makes sense, and it is worth considering. The positive attitude towards ICT should not be taken for granted. Teacher’s attitude towards the use of

ICTs in education, as mentioned in Zaranis et al. (2017) is not always positive. It is affected by various factors such as degree, additional studies, in-service experience, ICT. In our context, overall, we can conclude that students see ICT in education in a very positive way.

One of the hypothesis of our study was that **students' satisfaction, self-confidence and attitude towards change would be positively related to service-learning**. In other words, we expected that the students who are satisfied, self-confident and willing to change would be more concerned about social issues and more interested in social service (volunteerism). The results were in line with our hypothesis. In particular, students who had higher cooperation and communication skills, and were more aware of their strengths, weaknesses, and prejudices had the higher capacity of becoming active citizens (Chawla, 2009; Keser et al., 2011; Sabates-Wheeler et al., 2020). Moreover, those who had positive attitude towards changes, and were confident about achieving those changes had the higher capacity of becoming active citizens (Deeley, 2010). It seems that students' role as active citizens is empowered when they are able to connect theory and practice and take initiatives, as well as when they are able to challenge their ideas, values and beliefs and take actions towards change (Jenkins & Sheehy, 2019). Thus, it seems that self-awareness, cooperation, believing in changes and ability to build visions and take initiatives are important characteristics of active citizens (Bekkers, 2005; Luschei & Soto-Peña, 2019). In addition, these are the characteristics that we should nourish within the Primary Education Department if we want our students to become active citizens. Only by developing these characteristics in our students can we expect that those students will be able to develop the same characteristics in next generations, once they become teachers (Anderson, 1998).

Anderson and Pickeral (1999) suggested that when service-learning is applied to the education of students in Primary Education, it can provide valuable assets both to the community and the students themselves. Results of the present study are promising and seem to be in line with what Anderson and Pickeral suggested. In particular, data presented in this study enables an initial analysis of the implementation of service-learning in teacher's education, which may be a contribution to the progress of the field in Greece.

This study identified some very positive outcomes of service-learning as a teaching strategy on students of the Primary Education Department of the University of Crete. In particular, it has shown that both students can benefit from service-learning in terms of personal, academic and interpersonal development. Concerning personal development, our study has shown that service-learning can help students become more aware of themselves, their strengths, weaknesses, biases

and prejudices. Moreover, it can foster students' learning process, as it easily connects theory with practice. Our finding that service-learning can foster academic development is in line with previous research (Osgood, 2006), showing that service-learning significantly contributes to more effective education. Regarding interpersonal development, service-learning seems to promote the development of communication and cooperation skills in students. That is, according to our students, service-learning is beneficial on so many levels, as it helps young people develop a variety of skills. As Flouris & Ivrinteli (2009) observe by providing diverse learning opportunities, we offer students the chance to realize their strengths and weaknesses. That way, students will enhance their overall potential.

The previous paragraphs have shown that integrating service-learning into the educational system is worth the effort, as it is up to educational systems to provide knowledge, skills and tools to transform oneself and society towards a more sustainable future (Makrakis & Kostoulas - Makrakis, 2013). Undoubtedly, there is a long way to go before service-learning is integrated into Greek universities. Educational change is complex and contextual and requires cooperation between many structures and individuals to make it work (Burner, 2018). However, we have to start somewhere. I suggest starting from recognising the valuable contribution of professors who are trying to implement experiential methodologies, which involve community engagement. Apart from professors, universities will need a team of experts involved in the development of a university curriculum for the integration of service-learning (Bringle & Hatcher, 2000). This team should be responsible for careful planning, implementation, and evaluation of service-learning. For instance, in Spanish higher education, where such a team acts, service-learning has not been widely implemented (Colas et al., 2017). In particular, the lack of coordination structures and funding were the weakest parts during the integration process in Spain. Thus, the experts should take such information into account and should tend to eliminate all obstacles to successful integration.

While there is a growing interest in educational programs and educational innovations applied in other countries (Kazamias & Kalogianaki, 2003), not many studies of service-learning are conducted in Greece. Being one of the first studies of this kind in Greece, and thus, providing valuable insight into the matter of service-learning in our country is a particular strength of this study. This study has provided a "fertile ground" for further research of the topic in Europe and more specifically in Greece.

One of the most important strengths of this study is the use of mixed-methodology. In other words, in order to answer the research questions, this study used both quantitative (closed-ended

questionnaires) and qualitative (open-ended questionnaires, interviews, focus-groups, content analysis) methods.

Finally, the strength that I personally consider as very important is that this study has directly influenced our participants (Anderson, 1998). It enabled them to learn more about themselves and encouraged their engagement in the community. In other words, the students were encouraged to become active citizens by participating in this study.

Using the sample consisting only of students from Primary School Education Department at the University of Crete is also one of the limitations. Such sample limits the generalizability of our findings to other universities both in Greece and Europe in general. In addition, our sample mostly consisted of females, which also limits the generalizability of our findings. Future studies could address this limitation by conducting a similar study on a more diverse sample of participants – for instance, they could include more male participants, as well as participants from other departments and if possible, from other universities. Including a diverse sample and using both quantitative and qualitative methods is highly recommended, as it could enable us to obtain a more comprehensive understanding of service-learning in Greece.

The current study took place in the Department of Primary School Education in order to provide future educators with one more teaching strategy suitable for ESD. However, a drawback of this study is that it did not use longitudinal design. It would be informative to conduct a study that will follow the students into their future classrooms and explore whether they integrated service-learning in their teaching or not and why. Conducting such a study would provide an additional insight into the effects of service learning and its role in sustainable education.

One more limitation of this study was also the lack of data for direct comparison of the scores obtained before and after the course for all participants. In this study, we only had paired data for a small number of students who attended Seminar 06 and 07. Having a larger sample of students with paired data would enable us to draw more accurate conclusions about the effects of service-learning course on students.

Finally, there are not many questionnaires available that are related to service-learning. The questionnaires we used were created for this study, and were, therefore, used for the first time. Some of our subscales did not show high reliabilities, and also, we did not use the universal set of items for all questionnaires. As already mentioned in Chapter 5, psychometric characteristics of

service-learning questionnaires should be examined in a more detailed manner in the future, either by us or by other authors in the field.

Education needs a shift toward sustainability. We, as a society, are continually faced with challenges, and we need active citizens who can effectively rise to these challenges and build a sustainable world.

As described throughout this paper, service-learning seems to have the potential for fostering youth's development. Also, service-learning does not benefit only students as individuals, but also society in general. In particular, service-learning promotes active citizenship, meaning that it encourages students to take part in society, to strive towards positive changes and sustainable development.

Therefore, it is my belief that the integration of service-learning into primary education study programs seems to be the right step towards sustainable education. Both the available literature and the results of this study show that service-learning enables young people to develop and change for the better. Moreover, by changing themselves for the better, students become more able to change the world for the better, as well. This is of key importance as it has proven insufficient to dictate new curricula and expect everybody to follow (Tyack & Cuban, 1995). Instead, whenever we want to change something, it is always a good idea to pause, take a deep breath and change ourselves firstly, and other changes will follow.

## APPENDIXES

### Appendix A: Course Outline

<b>Course</b>	“Design and development of teaching material in an online environment and exercises” and “E-learning - Educational use of the Internet and exercises” (Seminar type courses)  ICT in Education for Sustainable Development (Core course)
<b>Prof. Dr.</b>	<b>VASSILIOS MAKRAKIS</b>
<b>Module 1</b>	Curriculum: Different Types and Functions
Key Concepts	Curriculum theory and types, technology,
Overview	When I ask my students what curriculum means to them, they always indicate that it means the hidden or written curriculum. However, the word "curriculum" means more things. Melding theory and the reality of school curriculum is also another issue often ignored in the educational process. It is therefore essential for students to develop a fundamental understanding of curriculum theory by providing the tools necessary for that. Questions to be addressed in this module include the following: What is the nature and function of curriculum theory? Why is it important to meld the theory and reality of school curriculum? What are the major classifications of curriculum theory? How has technology been a catalyst for curriculum change?
Aim	The overriding aim of this module is to turn students able to discourse on curriculum theories, types and functions and the impact technology can exert on curriculum change.
Learning Outcomes	At the end of this module learners will be able to: <ul style="list-style-type: none"> <li>• Identify and discuss the different types and functions of curriculum</li> <li>• Discuss how technology can contribute to curriculum change</li> </ul>
Units	Unit 1.1 Curriculum as a Body of Knowledge/Product Unit 1.2: Curriculum as Process Unit 1.3: Curriculum as Praxis (practice) Unit 1.4: Curriculum as Context
Readings	Fulya Damla Kentli (2009). Comparison of hidden curriculum theories. <i>European Journal of Educational Studies</i> 1 (2) 83-88. Grundy, S. (1987) <i>Curriculum: Product or Praxis</i> , Lewes: Falmer Aristotle (1976) <i>The Nicomachean Ethics</i> ('Ethics'), Harmondsworth: Penguin. Chapter 3: Curriculum Theory. <a href="http://www.sagepub.com/upm-data/6042_Chapter_3_Glatthorn_(Sage)_I_Proof_2.pdf">http://www.sagepub.com/upm-data/6042_Chapter_3_Glatthorn_(Sage)_I_Proof_2.pdf</a> Watson, D. (2001). Pedagogy before technology: Re-thinking the relationship between ICT and teaching. <i>Education and Information Technologies</i> 6:4, 251–266

<b>Activity</b>	<p><b>Overview</b></p> <p>Assignment 1.1: Reflecting Upon Curriculum</p> <ol style="list-style-type: none"> <li>1. Which theories and approaches to learning fit with your current attitude towards and/or method of teaching? (3-4 paragraphs)</li> <li>2. Which theories and approaches to learning do you disagree with in part or whole? Describe your reasons.</li> <li>3. "Role play" – Set up four characters in a short play. Have each of the four characters represent a different theory/type of curriculum. Ask each character to convince the other. Through that character's words in this role play, we will come to know of each of these curriculum types and their functions.</li> </ol> <p>Assignment 1.2: Applying Theory</p> <p>Which education theory are you most attracted to? Why?</p> <p>Which theory are you able to apply to your classroom? Why?</p> <p>What challenges or obstacles do you face in applying the chosen theory in your classroom?</p> <p>What kind of help do you need to overcome these obstacles?</p> <p>What is the Design Studio?</p> <p>Access and explore the following dynamic Web-based toolkit entitled Design Studio(<a href="http://jiscdesignstudio.pbworks.com/w/page/45526271/technologies%20for%20curriculum%20change">http://jiscdesignstudio.pbworks.com/w/page/45526271/technologies%20for%20curriculum%20change</a>) which draws together a range of existing and emerging resources around curriculum design and delivery and the role technology plays in supporting these processes and practices.</p>
<b>Module 2</b>	<b>Curriculum and a Whole School Approaches to ESD</b>
Key Concepts	Holism, whole school approach, ESD
Overview	<p>Education for Sustainable Development (ESD) consistently advocates a holistic and integrated approach to the infusion of ESD in the formal education system. This module will outline a whole-school approach, to ESD that includes examples where such an approach has been successfully implemented and highlights some of the key challenges that must be addressed to make the widespread adoption of the whole-school approach to ESD a reality. Questions to be addressed in this module are:</p> <p>A whole-school approach to sustainability addresses the concern that the day-to-day practices of the school, evident in the non-formal or hidden curricula, ought to be consistent with the teaching espoused within the classroom. Schools that employ whole-school approaches practice what they preach and also reinforce their espoused sustainability values with action. What is a “whole-school” approach to education for sustainability (EfS)? Is there more than one kind of whole-school approach? Does your school have a whole-school approach? If yes, how can you describe it? If not, how could you design a whole-school approach? How would be implemented?</p>
Aim	The overriding aim of this module is to Enhances understandings of the processes and practices that advance a whole school approach to EfS.
Learning Outcomes	<ul style="list-style-type: none"> <li>• At the end of this module learners will be able to:</li> <li>• Identify examples of whole school</li> <li>• Understand the processes to initiate a whole school approach to EfS</li> </ul>
Units	<p>Unit 2.1: Clarifying the concept of “whole school approaches” to EfS.</p> <p>Unit 2.2: The processes to initiate a whole school approach to EfS.</p> <p>Unit 2.3: The means to implement a whole-school approach</p> <p>Unit 2.3: Examples of whole-school approaches to EfS</p>

<p>Readings</p>	<p>Hargreaves, LG (2008) 'The whole-school approach to education for sustainable development: From pilot projects to systemic change' in Policy &amp; Practice: A Development Education Review, Vol. 6, Spring 2008, pp. 69-74, available: <a href="http://www.developmenteducationreview.com/issue6-perspectives2">http://www.developmenteducationreview.com/issue6-perspectives2</a>.</p> <p>Henderson, K and Tilbury, D. (2004) Whole-School Approaches to Sustainability: An International Review of Sustainable School Programs. Report Prepared by the Australian Research Institute in Education for Sustainability (ARIES) for The Department of the Environment and Heritage, Australian Government.</p> <p>Ferreira, J., Ryan, L. and Tilbury, D. (2006) Whole-School Approaches to Sustainability: A review of models for professional development in pre-service teacher education. Canberra: Australian Government Department of the Environment and Heritage and the Australian Research Institute in Education for Sustainability (ARIES).</p> <p>Whole School Approaches To Education For Sustainable Development Through School-Focused Professional Development (The SEEPS Project)          Tony Shallcross <a href="http://www.ceeindia.org/esf/download/paper51.pdf">http://www.ceeindia.org/esf/download/paper51.pdf</a>          Getting started on a whole of school approach to Education for Sustainability (EfS) <a href="http://www.decd.sa.gov.au/efs/pages/default/20754/?reFlag=1">http://www.decd.sa.gov.au/efs/pages/default/20754/?reFlag=1</a>          Kay-Barr, S. (2011). Green schools that teach: identifying attributes of whole-school sustainability. M.A. Thesis. Colorado State University <a href="http://www.ibe.colostate.edu/thesis/Barr_Thesis%20Final.pdf">http://www.ibe.colostate.edu/thesis/Barr_Thesis%20Final.pdf</a></p> <p>Gough, A. (2005). Sustainable Schools: Renovating Educational Processes. Applied Environmental Education and Communication, 4:339–351          Birney, A. and Reed, J. (2009) Sustainability and Renewal: Findings from the Leading Sustainable Schools research project, Nottingham: National College for Leadership of Schools and Children's Services. Available at: <a href="http://www.nationalcollege.org.uk/docinfo?id=33296&amp;filename=sustainability-and-renewal-full-report.pdf">www.nationalcollege.org.uk/docinfo?id=33296&amp;filename=sustainability-and-renewal-full-report.pdf</a>.</p> <p>Department for Children, Schools and Families (2010) National Framework for Sustainable Schools. Available at: <a href="http://www.rm.com/RMVirtual/Media/Downloads/National_Framework_Sustainable_Schools_poster.pdf">www.rm.com/RMVirtual/Media/Downloads/National_Framework_Sustainable_Schools_poster.pdf</a>.</p> <p>D Department for Children, Schools and Families (2010) Planning a Sustainable School. Available at: <a href="http://www.education.gov.uk/publications/eOrderingDownload/planning_a_sustainable_school.pdf">www.education.gov.uk/publications/eOrderingDownload/planning_a_sustainable_school.pdf</a>.</p> <p>Government Office for London (2008) Towards Whole School Sustainability: A view from London schools. London: GOL. Available at: <a href="http://lssf.co.uk/Documents/Towards_Whole_School_Sustain1.pdf">http://lssf.co.uk/Documents/Towards_Whole_School_Sustain1.pdf</a>.</p> <p>H Hicks, D. (2012) A sustainable future: four challenges for geographers, Teaching Geography, 36 (1): 9-11</p> <p>Ofsted (2009) Education for sustainable development: Improving schools, improving lives. Available at: <a href="http://www.ofsted.gov.uk/resources/education-for-sustainable-development-improving-schools-improving-lives">www.ofsted.gov.uk/resources/education-for-sustainable-development-improving-schools-improving-lives</a>.</p> <p>A framework for developing whole-school approaches to EfS. <a href="http://www.tlri.org.nz/sites/default/files/projects/9245_Appendix%20A.pdf">http://www.tlri.org.nz/sites/default/files/projects/9245_Appendix%20A.pdf</a></p> <p>Prain, V. &amp; Hand, B. (2003). Using new technologies for learning: A case study of a whole school approach. Journal of Research on Technology in Education. 35, 4 pp.441-458.</p>
<p>Activity</p>	<p><b>Overview</b></p> <p>Design a plan taking into consideration the rubrick found in the readings. This framework has been developed by a team of researchers who worked on a project funded by the Teaching and Learning Research Initiative: Investigating the Impact of Whole-school Approaches to Education for Sustainability on Student Learning.</p>

Module 3	Curriculum and Thematic Learning addressing Sustainability Themes
Key Concepts	Curriculum, thematic instruction, ESD
Overview	<p>As the world becomes more interlinked by human activities our problems become more complex - and their solutions more difficult to grasp. This has to be reflected in curricula. Interdisciplinary thematic units are a powerful tool for guiding learners in “seeing” the connections between the disciplines they study. Aiding learners in recognizing the patterns that weave facts, ideas, generalizations together across time and space helps them better understand themselves and the larger world. ESD-oriented thematic instruction is the organization of a curriculum around "themes that integrates basic disciplines like reading, writing, math, and science with the exploration of a broad subject such as communities, rain forests, river basins, the use of energy, etc. In other words, thematic instruction organizes activities or lessons around a general idea or theme meaningful to the learner. Thematic instruction can be a powerful tool for reintegrating the curriculum and eliminating the isolated, reductionist nature of teaching that is centered around disciplines rather than experience.</p>
Aim	This module aims at examining the relationship of curriculum with theme-based learning focussing on sustainability issues.
Learning Outcomes	<p>At the end of this module learners will be able to:</p> <ul style="list-style-type: none"> <li>• Demonstrate knowledge on the principles and practices for thematic instruction</li> <li>• Plan a lesson based on thematic instruction</li> </ul>
Units	<p>Unit 3.1: Models of sustainability curriculum integration  Unit 3.2: Choosing a sustainability theme  Unit 3.3: Designing the integrated sustainability curriculum  Unit 3.4: Developing the thematic instruction  Unit 3.5: Assessing the thematic instruction</p>
Readings	<p>Apgar1, J.M., Argumedo, A. &amp; Allen, W. (...). Building Transdisciplinarity for Managing Complexity: Lessons from Indigenous Practice <a href="http://learningforsustainability.net/pubs/BuildingTransdisciplinarityforManagingComplexity.pdf">http://learningforsustainability.net/pubs/BuildingTransdisciplinarityforManagingComplexity.pdf</a></p> <p>UNESCO: Teaching and Learning for a Sustainable Future: A Multimedia Teacher Education Programme.</p> <p>WWF (2008). Learning for sustainability: from the pupils' perspective  A report of a three-year longitudinal study of 15 schools from June 2005 to June 2008  <a href="http://assets.wwf.org.uk/downloads/wwf_report_final_web.pdf">http://assets.wwf.org.uk/downloads/wwf_report_final_web.pdf</a></p> <p>Kennelly, J. &amp; Taylor, N. (2007). Education for Sustainability for the K-6 Curriculum: A Unit of Work for Pre-Service. Australian Journal of Environmental Education, vol. 23, 3-12</p> <p>Scott, W. Sustainability and learning: what role for the curriculum? Council for Environmental Education in association with the Centre for Research in Education and the Environment, University of Bath <a href="http://www.bath.ac.uk/cree/resources/scott.pdf">http://www.bath.ac.uk/cree/resources/scott.pdf</a></p> <p>Educating for a sustainable future: A national environmental Education Statement for Australian Schools Commonwealth of Australia 2005  <a href="http://www.environment.gov.au/education/publications/pubs/sustainable-future.pdf">http://www.environment.gov.au/education/publications/pubs/sustainable-future.pdf</a></p>

<b>Overview</b>	
<i>Assignment 1: Generating Themes</i>	
<ol style="list-style-type: none"> <li>1. Think of 5 possible themes dealing with sustainability</li> <li>2. Next consider whether these themes are important in your community</li> <li>3. Look at your list, and choose one. Write 3-4 sentences telling more about it. Why might it be a useful theme? How does it fit into your community's and personal interest?</li> </ol>	
Find Sample Thematic Units	
<b>Activity</b>	Using the World Wide Web, locate at least three units (lesson plans) related to the theme you have chosen. Start your search for lesson plans using both lesson plans sites and/or writing key words describing your theme. Explain why a thematic approach is applied in the three chosen lesson plan?
Plan Your Own Thematic Unit	
You will develop the unit for a class of your choice. This unit plan will be described in a paper (maximum 4 pages) comprised of five interlinked sections (Activation, Teaching/ Learning Tasks, Learning Processes, Reflective Feedback and Cross-curriculum Extensions) that are explained in class.	
<b>Module 4</b>	<b>Digital Video Design for Advocacy, Empowerment and Change</b>
Key Concepts	Video, advocacy, <a href="#">rights and equality</a> , empowerment
Overview	The rapid development of multimedia and hypermedia technologies has provided new avenues for merging images, sound, movies and animation together with texts. Digital video production could offer possibilities for advocacy, empowerment and change. An empowering process is where video itself plays an emancipating role and advocacy for "lobbying," "campaigning," and "activism". In this way technology becomes a means to bring about social justice and environmental protection.
Aim	The overriding aim of this module is first to explore the potentialities of hypermedia technology through digital participatory video for advocacy, empowerment and capacity building and second to learn design digital vide-clips to serve the first aim.
Learning Outcomes	At the end of this module learners will be able to: <ul style="list-style-type: none"> <li>• Demonstrate knowledge on the concept of participatory video (PV)</li> <li>• Plan, develop and assess a participatory video product addressing ESD themes</li> </ul>
Units	Unit 3.1: Conceptualising PV project idea Unit 3.2: Developing PV project proposal Unit 3.3: Doing PV research Unit 3.4: Writing/revising script/storyboard

Readings	<p>Manual on Movie Maker 2 and other software</p> <p>Mackay, W. E. Video Techniques for Participatory Design: Observation, Brainstorming &amp; Prototyping. CHI 2000 Tutorial <a href="http://www.daimi.au.dk/~mackay">http://www.daimi.au.dk/~mackay</a></p> <p>Lynagh, M. (2010). Using video in community health advocacy: Critical review of a participatory workshop with Breastfeeding Patrol, Mandaluyong City, Manila. Submitted in partial fulfilment of the MA degree in Development and Emergency Practice Oxford Brookes University</p> <p>Fab, S. &amp; Kay, S. Using communication media as a tool for campaigning: Air France In-flight Video Evaluation of the Austria In-flight Video. ECPAT International</p>
Activity	<p><b>Overview</b></p> <p><b>Assignment:</b> Good video production begins with good planning and storyboarding. Go to <a href="#">KidzOnline</a>, select the Guest Login link and register for this free resource. Then select the <a href="#">Tech Training</a> tab and check out the Technology Units available. Select the Digital Video Unit and Stream the following selections: #2 <a href="#">Digital Video: Getting Started</a> and #4 <a href="#">Digital Video: Storyboard</a>.</p> <p>Assignment : Using the WWW search for participatory video clips addressing ESD themes with particular to your own theme chosen.</p> <p><b>Assignment :</b></p> <p><b>Prepare a research proposal</b></p> <p><b>Do research</b></p> <p><b>Storyboarding Exercise</b></p> <p>For your object description assignment, you'll need to create a storyboard as part of the planning and development process. As storyboarding practice, this exercise asks you to take a TV commercial and construct a storyboard for it, the reverse of the normal storyboarding process. In assessing your Storyboarding Assignment, consider the rubrick provided.</p>
<b>Module 5</b>	<b>Video Clips Production</b>
Key Concepts	Production processes, techniques

Overview	<p>Digital Video Production is the filming that brings your video storyboard to life. The actual filming "on location" is known as production, while the editing process is known as post-Production. Like, the planning (pre-production) process, some tasks, such as research for post-production narration or sound, may take place both in the planning and production phases. Here are just a few of the issues that must be considered throughout the shot.</p> <ul style="list-style-type: none"> <li>• Where to focus the lens</li> <li>• How the light is striking the subject</li> <li>• Does the iris or white balance need to be set for the light conditions</li> <li>• Will the camera have to be moved during the shot</li> <li>• Is the background appropriate</li> <li>• How to frame the shot</li> <li>• Whether to move the zoom or change the focus during the shot</li> <li>• Is the mike picking up the sound at the right level</li> <li>• Is there distracting background sound or noise</li> </ul>
Aim	The overriding aim of this module is to equip students with the capacity to actualise their storyboards.
Learning Outcomes	<p>At the end of this module learners will be able to:</p> <ul style="list-style-type: none"> <li>• Shooting video</li> <li>• Work with others in groups</li> <li>• Use video equipment</li> <li>• Logging and capturing footage</li> </ul>
Units	<p>Unit 5.1: Filming</p> <p>Unit 5.2: Logging and capturing footage</p>
Readings	<p>Windows Movie Maker free online video <a href="http://www.atomiclearning.com/moviemaker2">tutorials</a> from Atomic Learning are available at <a href="http://www.atomiclearning.com/moviemaker2">http://www.atomiclearning.com/moviemaker2</a>. These tutorials are very helpful in learning the various features of Movie Maker. (You will need the QuickTime video player to view the Atomic Learning tutorials. If needed, click on <a href="#">QuickTime</a> to download the latest version.)</p>
Activity	<b>Overview</b>
	<b>Start the production process</b>
<b>Module 6</b>	<b>Video-clip Post-Production</b>
Key Concepts	Editing, narrating, exporting
Overview	<p>Once the footage has been captured, it needs to be put together in a meaningful way based on the story and storyboards. This process is called editing. Clips may need to be trimmed to make them shorter, and in some cases a shot may need to be redone because of lack of media or bad lighting etc. Students can creatively determine which shots best tell the story. Sometimes a simple change in camera angles makes one shot better than another. During editing, students also may add a soundtrack or narration. This may require hooking up a microphone so the "voice talent" can narrate based on the footage being used for the project. Students can experiment with transitions between clips, as well. Remember it is really easy to overuse transitions. In most cases, simple cuts work well to tell a story. <b>Titles, Text, Credits</b> - Although this may be part of the editing step, this can also be done during post-production as well. Make sure every project participant is in the credits since it may eventually appear in the student's portfolio. Any other graphics or enhancements can also be added at this time. <b>Print to tape/export for web</b> - Once the project is complete, it's ready to be printed back to tape via Firewire or to be exported as a movie for use on the web or CD.</p>

Aim	The overriding aim of this module is to learn the processes for editing and finalising the video clip assigned
Learning Outcomes	At the end of this module learners will be able to: <ul style="list-style-type: none"> <li>Apply all techniques for editing and exporting the video clip assigned</li> </ul>
Units	Unit 6.3: Editing Unit 6.4: Titles, Text, Credits Unit 6.5: Print to tape/export for web
Readings	A compilation of hands-out
Activity	<b>Overview</b>
	<b>Implementing the production</b>
<b>Module 7</b>	<b>Integrating the video clip into the thematic unit</b>
Key Concepts	Lesson planning, thematic integration
Overview	Planning, developing and producing a video clip dealing with a sustainable development issue should be seen in the context of teaching and learning process. Accordingly, the video clip should be integrated into a lesson plan.
Aim	The overriding aim of this module is to help students integrate the video clip into the curriculum
Learning Outcomes	At the end of this module learners will be able to: <ul style="list-style-type: none"> <li>Demonstrate knowledge on lesson planning</li> <li>Applying knowledge and techniques for integrating learning objects such as a video clip into lesson planning</li> </ul>
Units	Unit 6.1: Integrating the video clip into the curriculum Unit 6.2: Uploading video clip
Readings	<a href="#">Ourmedia.org</a> Publish & store your creations- video, audio, text or graphics.  <a href="#">Google Video</a> : Upload or download, digital videos of any size or length.
Activity	<b>Overview</b>
	<a href="#">You Tube</a> : Upload almost any video format, watch streaming video and share your video creations with anyone. <a href="#">Converting You Tube files for use in Movie Maker</a> . Native format not supported in Movie Maker.  <a href="#">TeacherTube</a> : Video and social networking site offers 11 customized channels for teachers to upload and share videos of best practices, tutorials and student projects in a content-controlled environment.

## Appendix B. Research Data

Course	Sample	Description of data	Data collected	Course duration	Methodology
ICT in ESD	132 students	Open - ended questions (Q <sub>1</sub> )	Before the course (October 2013)	Oct 2013 - Jan 2014	4.3.1 Kostoulas - Makrakis (2005)
ICT in ESD	163 students	Open - ended questions & Close - ended questions (Q <sub>2</sub> )	After the course (March 2014)	Oct 2013 - Jan 2014	4.3.3 SPSS/mixed-method Terrel (2012)
ICT in ESD	Focus group discussion	Audio clip	After the course (2 April 2014)	Oct 2013 - Jan 2014	4.3.2 Kvale (1996)
School Practice	23 students	Open - ended questions (Q <sub>1</sub> )	Before the course (October 2013)	Oct 2013 - Jan 2014	4.3.1 Kostoulas - Makrakis (2005)
Seminar 06	27 students	Open - ended questions (Q <sub>3</sub> )	Before the seminar (2nd semester 13 - 14)	Feb 2013 - Jun 2014	4.3.1 Kostoulas - Makrakis (2005)
Seminar 06	29 students	Open - ended questions & Close - ended questions (Q <sub>4</sub> )	Before the seminar (2nd semester 13 - 14)	Feb 2013 - Jun 2014	4.3.3 SPSS/mixed-method Terrel (2012)
Seminar 06	3 Skype Interviews	Interviews	After the seminar (June 14)	Feb 2013 - Jun 2014	4.3.2 Kvale (1996)
Seminar 07	19 students	Open - ended questions (Q <sub>3</sub> )	Before the seminar (2nd semester 13 - 14)	Feb 2013 - Jun 2014	4.3.1 Kostoulas - Makrakis (2005)
Seminar 07	25 students	Open - ended questions & Close - ended questions (Q <sub>4</sub> )	Before the seminar (2nd semester 13 - 14)	Feb 2013 - Jun 2014	4.3.3 SPSS/mixed-method Terrel (2012)
Seminar 07	3 Skype Interviews	Interviews	After the seminar (June 14)	Feb 2013 - Jun 2014	4.3.2 Kvale (1996)
ICT in ESD	141 students	Open - ended questions (Q <sub>1</sub> )	Before the course (October 14)	Oct 2014 - Jan 2015	4.3.1 Kostoulas - Makrakis (2005)
Seminars	47 students	Close - ended questions (Q <sub>5</sub> )	After the seminars (July 14)	Feb 2013 - Jun 2014	4.3.3 SPSS/mixed-method Terrel (2012)
ICT in ESD	101 students	Open - ended questions & Close - ended questions (Q <sub>2</sub> )	After the course (February 15)	Oct 2014 - Jan 2015	4.3.3 SPSS/mixed-method Terrel (2012)

## Appendix C. Interview Protocol

### **Introduction statement:**

Thank you for agreeing to take part in this study. This interview will be recorded. The audio file will be transcribed using a pseudonym in place of your real name. All data collected in this study will be confidential. The information you share will be used to help us understand better the findings of this study. Please feel free to stop me, slow me down, ask questions or make comments anytime.

### **Interview Questions:**

- Please report the contribution of the experience (service-learning, problem-based learning and video development) to your personal development and interests.
- Have you changed your opinion on what is learning as a result of the seminar you attended? How?
- Have you changed your opinion on the role of teachers as a result of the seminar you attended? How?
- Have you changed your opinion on the role of education in general as a result of the seminar you attended? How?
- Have you changed your opinion on your role as a citizen, at local, national and global level? How?

### **Interviews' details:**

Researcher conducted six interviews. Instructor selected three participants of each seminar. All interviews were conducted after the end of the seminars, during the month of June 2014.

## Appendix D: Questionnaires

### **Questionnaire no1**

1. What comes into your mind when you hear the concept: “service - learning”? (Answer with at least three words or phrases.)
2. With which teaching/learning methods do you think the concept of service-learning is related?
3. Is there any circumstance from your own life that relates to the concept of service-learning? Describe briefly.
4. Is there any circumstance that you are aware of from other sources, like friends, media, internet or fellow students that are related to the concept of service-learning? Describe briefly.
5. How do you conceive the relationship of this concept with new technologies? Describe briefly.

## Questionnaire no2

GENDER- MALE ..... FEMALE .....

SEMESTER OF STUDIES.....

CLASS ATTENDANCE (Fill in with an X, next to the answer that corresponds)

Less than 5 lectures .....

6-9 lectures .....

10-13 lectures .....

Have you completed and sent the video? YES..... NO....

Have you participated in any volunteer action before this course? YES..... NO....

If, YES, what kind of action, when and where?

To participate in volunteer service was:

Personal decision .....

Parents' Urging .....

Encouraged as a part of school/university activities .....

Encouraged by relevant organisations .....

E. Other (what?) .....

Before this course have you attended another course where there was an apparent reference and implementation of service-learning?

YES.... NO....

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Do you recall something of the following occurring in your family? (Fill in your answer with an X).

My mother took up volunteer service in the community. ....

My father took up volunteer service in the community. ....

None of the above .....

	Less interesting	About the same	Interesting	More interesting
<b>Level of interest</b>				

In comparison with other courses that you have attended in the Department of Education, to a scale from 1 to 4, how would you rate this course in comparison to: ( Fill in an X next to your answer)

	Less learned	Learned about the same	Learned a little more	Learned more
<b>Level of learning</b>				

	Less than other courses	About the same	A little more	More
<b>Level of connection between theory and practice</b>				
<b>Level of active participation</b>				

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The instructor of the course (Fill in with X in the square of your choice):

Showed a personal interest in my learning.	
Scheduled course work at an appropriate pace.	
Provided clear instructions for assignments.	
Created an atmosphere that encouraged active student participation.	
Provided helpful feedback on assignments.	
Provided relevant educational material.	
Encouraged interaction outside of class.	
Provided clear assessment criteria.	

For the following questions please choose what most represents your experience from this course (Put an X on the square of your choice):

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
I enjoyed the course process more than other courses that I have attended.				
I will use service-learning in my future projects.				
More courses at my university should integrate service-learning.				
The use of service-learning required more time to study in relation to other courses.				
The use of service-learning is worth the effort.				

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	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
I enjoy having discussions with people whose ideas and values are different from mine.				
Service-learning improved my ability to communicate with my fellow students and “others” related to the course.				
The creation of the video helped me to understand the connection between the course’s context and real life situations.				
The world is run by a few people in power and there is not much the average person can do about it.				
I enjoy taking courses that challenge my beliefs and values.				
I think that the video I created contributed or it could contribute to the issue or the problem it deals with.				
I think that the video I created contributed to developing knowledge and skills which will be useful to me in other situations.				
I feel that I can have a positive impact on the community in which I live.				
It is easy for me to neglect my interest for the common good.				
I am confident that, through my work, I can help in building a more sustainable world.				
The course and the projects I carried out, helped me learn more about myself.				
Knowing how to use technology makes me feel better integrated into society.				
I think that the video I created has contributed to enhancing my understanding of the course material.				

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	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
The courses that I enjoy the most are those that make me think about things from a different perspective.				
It is very important to me to give 3% or more of my income to help those in need.				
My participation in this course helped me to connect what I learned to real life situations.				
It is crucial to me to develop a philosophy of life which promotes personal and social changes.				
I am motivated by courses that contain hands-on applications of theories to real-life situations.				
I feel that I can make a difference in the world.				
I believe that I can have enough influence to impact community decisions.				
The course allowed me to see my own personal strengths and weaknesses.				
While working on a group project, I can easily accept others' criticism of my work.				
I would be interested in seeking opportunities for service in organisations or other sectors different from school.				
The course made me more aware of my own biases and prejudices.				
I feel that I can play an important part in improving the wellbeing of my community.				

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	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
I learn the course content better when connections to real life situations are made.				
I feel that social problems are not my concern.				
Skills and experiences that I gain from community service will be valuable in my career.				
This course enhanced my communication skills.				
My studies in the Primary Education Department should give me more opportunities other than teaching.				
The video I created seems to have contributed to understand the content of the course better.				
Community service and voluntary work will help me develop leadership skills.				
The course offered me opportunities that allowed me to feel personally engaged in my learning.				
Providing service to the community is something I prefer to let others do.				
I enjoyed the teaching of this course more than other courses that I have attended.				
I will use service-learning in my future projects.				

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Report the contribution of your experience with the development of the participatory video

1. In your personal development and interests
2. In the implementation of the goals of the video's subject

Did you reconsider the definition of learning as a result of the course you attended? How?

Did you reconsider the role of the educators as a result of the course you attended? How?

During the procedure of service-learning, did you experience some pleasant or unpleasant events? Please describe these events briefly.

Do you think that the "pleasant" experiences increased your enthusiasm for learning in this course? Why?

Do you think that "unpleasant" experiences reduce your enthusiasm for learning in this course? Why?

What have you learned from service-learning?

What is the most satisfying experience you have won from this course?

After this course for service-learning, what new have you discovered:

1. for yourself?
2. for your fellow students?
3. for the "others" that participated in the video?
4. for the issue or the problem, you have been dealing with

Describe briefly, what did you get out of this course by participating in service-learning.

### **Questionnaire 3**

#### **Information and Communication Technologies (ICT)**

Why are ICTs taught and used in primary education?

What do you think is an excellent way to teach or use ICT?

Make a conceptual map of ICT teaching. Add anything you think of good ICT teaching.

Make a conceptual map of the use of ICT. Add anything you think a good use of ICT.

Which teaching methods would you like to use in schools?

#### **Problem Based Learning (PBL)**

What do you think PBL is?

What do you consider as the most essential thing in PBL?

What do you think as a good PBL practice: Give an example in words or a graph.

#### **Service-Learning (SL)**

What do you think SL is?

What do you consider as the most essential element in SL?

What do you consider as a good SL practice? Give an example in words or a graph.

#### **Climate Change**

How do you think a teacher could act if he understood that his students have misconceptions about climate change?

## Questionnaire no4

GENDER- MALE ..... FEMALE .....

SEMESTER OF STUDIES.....

Have you participated in any volunteer action before this course? YES..... NO....

If, YES, what kind of action, when and where?

To participate in volunteer service was:

Personal Decision .....

Parents' Urging .....

Encouraged as a part of school/university activities .....

Encouraged by relevant organisations .....

E. Other (what?)

What does service-learning mean for you?

Have you attended another course/seminar where service-learning mentioned clearly and implemented?

YES.... NO....

If YES, name the course or the courses/seminars.

Do you remember happening something of the following in your family? (Fill in your answer with an X).

My mother took up volunteer service in the community. ....

My father took up volunteer service in the community. ....

None of the above .....

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For the following questions please choose what most represents your experience from this course (Put an X on the square of your choice):

	Strongly Agree	Agree	Disagree	Strongly Disagree
I enjoy having discussions with people whose ideas and values are different from mine.				
The world is run by a few people in power and there is not much the average person can do about it.				
I enjoy taking courses that challenge my beliefs and values.				
I feel that I can have a positive impact on the community in which I live.				
It is easy for me to neglect my interest for the common good.				
I am confident that, through my work, I can help in building a more sustainable world.				
Knowing how to use technology makes me feel better integrated into society.				
The courses that I enjoy the most are those that make me think about things from a different perspective.				
It is very important to me to give 3% or more of my income to help those in need.				
It is crucial to me to develop a philosophy of life which promotes personal and social changes.				
I am motivated by courses that contain hands-on applications of theories to real-life situations.				

	Strongly Agree	Agree	Disagree	Strongly Disagree
I feel that I can make a difference in the world.				
I believe that I can have enough influence to impact community decisions.				
While working on a group project, I can easily accept others' criticism of my work.				
I would be interested in seeking opportunities for service in organisations or other sectors different from school.				
I feel that I can play an important part in improving the wellbeing of my community.				
I learn the course content better when connections to real life situations are made.				
I feel that social problems are not my concern.				
My studies in the Primary Education Department should give me more opportunities other than teaching.				
Community service and voluntary work will help me develop leadership skills.				
Providing service to the community is something I prefer to let others do.				
I think that most people around the world get what they are entitled to have.				
It is OK if some people in the world have more opportunities than others.				
I think that people around the world get the rewards and punishments they deserve.				

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	Strongly Agree	Agree	Disagree	Strongly Disagree
In times of scarcity, it is sometimes necessary to use force against others to get what you need.				
The world is generally a fair place.				
No one country or group of people should dominate and exploit others in the world.				
The needs of the worlds' most fragile people are more pressing than my own.				
I think that many people around the world are poor because they do not work hard enough.				
I respect and I am concerned about the rights of all people, globally.				
Developed nations have the obligation to make income around the world as equitable as possible.				
Americans should emulate the more sustainable and equitable practices of other developed countries.				
I do not feel responsible for the world's inequities and problems.				
I know several ways in which I can make a difference on some of this world's most worrisome problems.				
I am able to get other people to care about global problems that concern me.				
I unconsciously adapt my behavior and mannerisms when I am interacting with people of other cultures.				

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	Strongly Agree	Agree	Disagree	Strongly Disagree
I often adapt my communication style to other people's cultural background.				
I am able to communicate in different ways with people from different cultures.				
I am fluent in more than one language.				
I welcome working with people who have different cultural values from me.				
I feel comfortable expressing my views regarding a pressing global problem in front of a group of people.				
I am able to write an opinion letter to a local media source expressing my concerns over global inequalities and issues.				
Over the next 6 months, I plan to do volunteer work to help individuals and communities abroad.				
Over the next 6 months, I will participate in a walk, dance, run, or bike ride in support of a global cause.				
Over the next 6 months, I plan to get involved with a global humanitarian organization or project.				
Over the next 6 months, I plan to help people from other countries who are in difficulty.				
Over the next 6 months, I plan to get involved in a program that addresses the global environmental crisis.				
Over the next 6 months, I will pay a membership or make a cash donation to a global charity.				

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	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
Over the next 6 months, I will contact a newspaper or radio station to express my concerns about global environmental, social, or political problems.				
Over the next 6 months, I will express my views about international politics on a website, blog, or chat room.				
Over the next 6 months, I will sign an e-mail or written petition seeking to help individuals or communities abroad.				
Over the next 6 months, I will participate in a campus forum, live music, or theater performance or other event where young people express their views about global problems.				
If at all possible, I will always buy fair-trade or locally sourced products and brands.				
I will deliberately buy brands and products that are known to be good stewards of marginalized people and places.				
I will boycott brands or products that are known to harm marginalized global people and places.				

## Questionnaire no5

SEMINAR:

GENDER- MALE ..... FEMALE.....

Have you participated in any volunteer action AFTER or DURING this seminar?

YES.... NO....

If, YES, what kind of action, when and where?

To participate in volunteer service was:

Personal Decision .....

Parents' Urging .....

Encouraged as a part of school/university activities .....

Encouraged by relevant organizations .....

E. Other (what;)

What does it mean for you service- learning?

Time spent for this course was

Much more than other courses .....

About the same .....

Less than other courses .....

Much less than other courses .....

	Less interesting	About the same	Interesting	More interesting
<b>Level of interest</b>				

In comparison with other courses that you have attended in the Department of Education, to a scale from 1 to 4, how would you rate this course in comparison to: ( Fill in an X next to your answer)

	Less learned	Learned about the same	Learned a little more	Learned more
<b>Level of learning</b>				

	Less than other courses	About the same	A little more	More
<b>Level of connection between theory and practice</b>				
<b>Level of active participation</b>				

**The instructor of the course (Fill in with X in the square of your choice):**

Showed a personal interest in my learning.	
Scheduled course work at an appropriate pace.	
Provided clear instructions for assignments.	
Created an atmosphere that encouraged active student participation.	
Provided helpful feedback on assignments.	
Provided relevant educational material.	
Encouraged interaction outside of class.	
Provided clear assessment criteria.	

For the following questions please choose what most represents your experience from this course

(Put an X on the square of your choice):

	Strongly Agree	Agree	Disagree	Strongly Disagree
I enjoy having discussions with people whose ideas and values are different from mine.				
The world is run by a few people in power and there is not much the average person can do about it.				
I enjoy taking courses that challenge my beliefs and values.				
I feel that I can have a positive impact on the community in which I live.				
It is easy for me to neglect my interest for the common good.				
I am confident that, through my work, I can help in building a more sustainable world.				

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
Knowing how to use technology makes me feel better integrated into society.				
The courses that I enjoy the most are those that make me think about things from a different perspective.				
It is very important to me to give 3% or more of my income to help those in need.				
It is crucial to me to develop a philosophy of life which promotes personal and social changes.				
I am motivated by courses that contain hands-on applications of theories to real-life situations.				
I feel that I can make a difference in the world.				
I believe that I can have enough influence to impact community decisions.				
I believe that I can have enough influence to impact community decisions.				
I would be interested in seeking opportunities for service in organisations or other sectors different from school.				
I feel that I can play an important part in improving the wellbeing of my community.				
I learn the course content better when connections to real life situations are made.				
I feel that social problems are not my concern.				
My studies in the Primary Education Department should give me more opportunities other than teaching.				
Community service and voluntary work will help me develop leadership skills.				
Providing service to the community is something I prefer to let others do.				

	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
I think that most people around the world get what they are entitled to have.				
It is OK if some people in the world have more opportunities than others.				
I think that people around the world get the rewards and punishments they deserve.				
In times of scarcity, it is sometimes necessary to use force against others to get what you need.				
The world is generally a fair place.				
No one country or group of people should dominate and exploit others in the world.				
The needs of the worlds' most fragile people are more pressing than my own.				
I think that many people around the world are poor because they do not work hard enough.				
I respect and I am concerned about the rights of all people, globally.				
Developed nations have the obligation to make income around the world as equitable as possible.				
Americans should emulate the more sustainable and equitable practices of other developed countries.				
I do not feel responsible for the world's inequities and problems.				
I know several ways in which I can make a difference on some of this world's most worrisome problems.				

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	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
I am able to get other people to care about global problems that concern me.				
I unconsciously adapt my behavior and mannerisms when I am interacting with people of other cultures.				
I often adapt my communication style to other people's cultural background.				
I am able to communicate in different ways with people from different cultures.				
I am fluent in more than one language.				
I welcome working with people who have different cultural values from me.				
I feel comfortable expressing my views regarding a pressing global problem in front of a group of people.				
I am able to write an opinion letter to a local media source expressing my concerns over global inequalities and issues.				
Over the next 6 months, I plan to do volunteer work to help individuals and communities abroad.				
Over the next 6 months, I will participate in a walk, dance, run, or bike ride in support of a global cause.				
Over the next 6 months, I plan to get involved with a global humanitarian organization or project.				

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	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
Over the next 6 months, I plan to help people from other countries who are in difficulty.				
Over the next 6 months, I plan to get involved in a program that addresses the global environmental crisis.				
Over the next 6 months, I will pay a membership or make a cash donation to a global charity.				
Over the next 6 months, I will contact a newspaper or radio station to express my concerns about global environmental, social, or political problems.				
Over the next 6 months, I will express my views about international politics on a website, blog, or chat room.				
Over the next 6 months, I will sign an e-mail or written petition seeking to help individuals or communities abroad.				
Over the next 6 months, I will participate in a campus forum, live music, or theater performance or other event where young people express their views about global problems.				
If at all possible, I will always buy fair-trade or locally sourced products and brands.				
I will deliberately buy brands and products that are known to be good stewards of marginalized people and places.				

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	<b>Strongly Agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
I will boycott brands or products that are known to harm marginalized global people and places.				
Sometimes I doubt the way somebody is doing something and I am trying to think of a better way.				
I have changed the way I think of myself, as a result of the course.				
This course has "shaken" some of my strongly rooted perceptions.				
I have changed the way I usually do things, thanks to the course I attended.				
During the course I discovered mistakes in things I thought right.				
I like to think again about what I'm doing and find alternative ways to do it.				
Sometimes I question the way someone does something and try to think of a better way.				
I like to think again about what I'm doing and find alternative ways to do it.				
I often reflect on my actions to see if I could have improved what I did.				
I often reevaluate my experiences in order to learn and improve my next accomplishment.				

What do you think about the overall design of the seminar?

Describe what helped you most in preparing for the use of the problem-base approach.

How did this seminar design motivate you to learn (or not)?

In which ways has the problem-based approach changed your opinion about learning, if changed it?

Describe the experiences of problem-based learning that you find difficult.

How do you compare problem-based learning with other forms of teaching?

Answer the following questions, self-assessing the contribution of the seminar, giving an example of your feedback.

I have changed my way of thinking about teaching. - Give an example.

I have changed my way of thinking about learning. - Give an example.

I have changed my personal attitudes and beliefs. - Give an example.

I have improved my ability to deal with controversial issues. - Give an example.

I have improved my ability to work as a team member. - Give an example.

I have improved my ability to manage my own learning and personal development. - Give an example.

I have improved my ability to use new technologies. - Give an example.

How do you judge the problem-based learning model on which your first project was based?

What did you get from developing your own digital storytelling?

Appendix E: Posters from actions



# Ημερίδα

27 ΜΑΙΟΥ 2015

9:00 - 13:00

Οι φοιτητές κάνουν  
τη διαφορά

ψηφιακές αφηγήσεις  
& δράσεις

Αίθουσα Δ7

Παρεμβάσεις φοιτητών για την προώθηση του Πανεπιστημίου Κρήτης  
σε Βιώσιμο/Αειφόρο Πανεπιστήμιο και το Ρέθυμνο ως μια  
Βιώσιμη/Αειφόρο Πόλη στο πλαίσιο του μαθήματος "Τεχνολογίες  
Πληροφορίας και Επικοινωνίας στην Εκπαίδευση για τη Βιώσιμη  
Ανάπτυξη"



ΠΑΙΔΑΓΩΓΙΚΟ ΤΜΗΜΑ ΔΗΜΟΤΙΚΗΣ ΕΚΠΑΙΔΕΥΣΗΣ  
ΕΔΡΑ UNESCO ΤΠΕ ΣΤΗΝ ΕΚΠΑΙΔΕΥΣΗ ΓΙΑ ΤΗ ΒΙΩΣΙΜΗ ΑΝΑΠΤΥΞΗ

**Σβήστε τις συσκευές,  
αντί να τις διατηρείτε σε κατάσταση αναμονής!**  
σβήστε όλον τον εξοπλισμό με την αποχώρηση  
προσπαθήστε να αποσυνδέετε τη συσκευή από την πρίζα

**Κλείνετε τα κλιματιστικά!**  
δυστυχώς μερικές φορές  
λειτουργούν χωρίς να κάνει ζεστή ή  
χωρίς να υπάρχει κάποιος στην αίθουσα

**Ελέγξτε αν έχετε  
σβήσει τα φώτα!**  
όταν αποχωρείτε  
από τις τουαλέτες,  
τις αίθουσες  
και κάθε  
κοινόχρηστο χώρο

**Στόχος:  
20% Εξοικονόμηση  
Ενέργειας Ετήσια**

Επιστροφή του κέρδους  
από την εξοικονόμηση ενέργειας  
σε ταμείο αρωγής φοιτητών και  
κοινωνικών ομάδων που έχουν ανάγκη

ΟΜΑΔΑ ΕΘΕΛΟΝΤΩΝ ΔΡΑΣΗΣ ΜΑΘΗΣΗΣ ΓΙΑ ΤΗΝ ΚΟΙΝΩΝΙΚΗ ΠΡΟΣΦΟΡΑ

ΠΑΙΔΑΓΩΓΙΚΟ ΤΜΗΜΑ ΔΗΜΟΤΙΚΗΣ ΕΚΠΑΙΔΕΥΣΗΣ  
ΕΔΡΑ UNESCO ΤΠΕ ΣΤΗΝ ΕΚΠΑΙΔΕΥΣΗ ΓΙΑ ΤΗ ΒΙΩΣΙΜΗ ΑΝΑΠΤΥΞΗ

**Άσε το δίσκο!  
Σκέψου το περιβάλλον!**

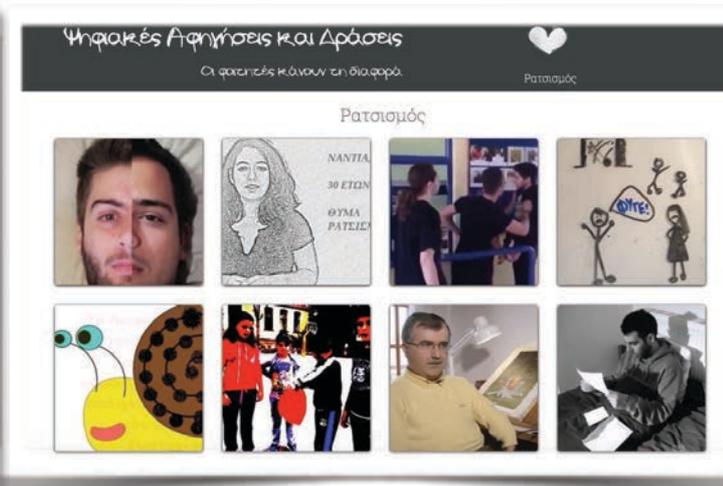
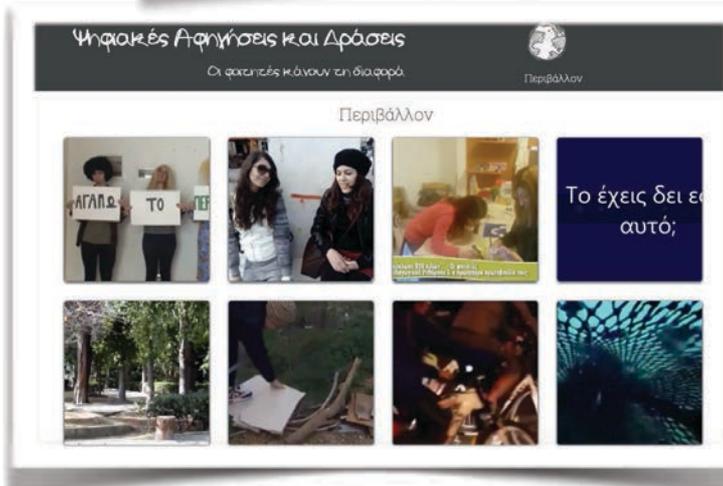
Χωρίς δίσκο στο εστιατόριο πετυχαίνεις:

- μείωση χημικών καθαριστικών
- εξοικονόμηση νερού
- 25 - 30% εξοικονόμηση ενέργειας
- 20% λιγότερα οργανικά απόβλητα

**ΕΣΥ; Θα πάρεις  
δίσκο σήμερα;**

ΟΜΑΔΑ ΕΘΕΛΟΝΤΩΝ ΔΡΑΣΗΣ ΜΑΘΗΣΗΣ ΓΙΑ ΤΗΝ ΚΟΙΝΩΝΙΚΗ ΠΡΟΣΦΟΡΑ

Appendix F: Website Screenshots



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